

Fastener Tightening Specifications

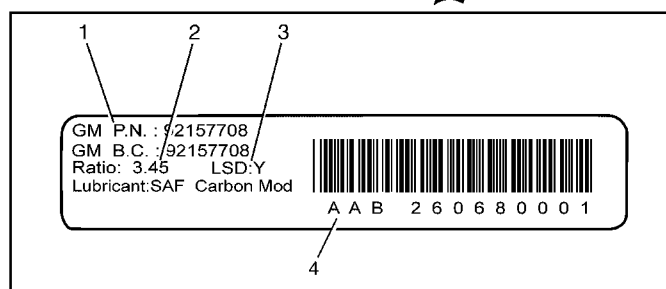
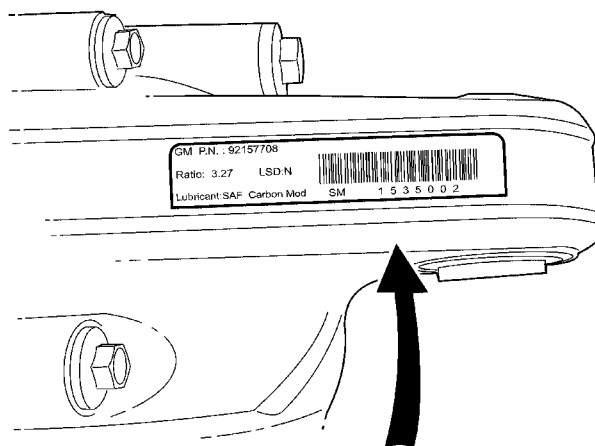
Application	Specification	
	Metric	English
2 Bearing Retaining Bolts M14x135 (2x)	153 N-m	112 lb ft
2 Bearing Retaining Bolts M14x100 (2x)	153 N-m	112 lb ft
6 Differential Housing Retaining Bolts M10x1.5x75 (6x)	53 N-m	39 lb ft
10 Ring Gear Retaining Bolts M12 (10x)	125 N-m	92 lb ft
Pinion Flange Nut (In Vehicle)	Record pinion drag torque before removal and torque to the same value on installation.	Record pinion drag torque before removal and torque to the same value on installation.
Pinion Flange Nut (Out of Vehicle)	2.5 N-m	23 lb in
Differential Fill Plug	35 N-m	26 lb ft
Differential Drain Plug	35 N-m	26 lb ft
Breather Fitting	15 N-m	11 lb ft
Differential to Subframe Retaining Nuts	80 N-m	59 lb ft

Lubrication Specifications

Capacities

Application	Quantity	
	Metric	English
Important: Both LSD and Non-LSD Differentials use the same fluid.		
Differential Lubricant-Castrol SAF Carbon Mod. GM P/N 92184900		
Fill Capacity	1.25 L	1.32 Qt

Rear Axle Usage



- (1) GM Part Number
- (2) Differential Ratio
- (3) L.S.D Yes or L.S.D No
- (4) GM Broadcast Code

Available Axle Ratios

Axle Ratio	LSD	Drive / Engine	Flange PCD
2.92	No	V6 5 speed auto	96mm
2.92	Yes	V8 6 speed auto	110mm

[2009 Pontiac G8](#) | [G8 Service Manual](#) | [Driveline/Axle](#) | [Rear Drive Axle](#) | [Specifications](#) |

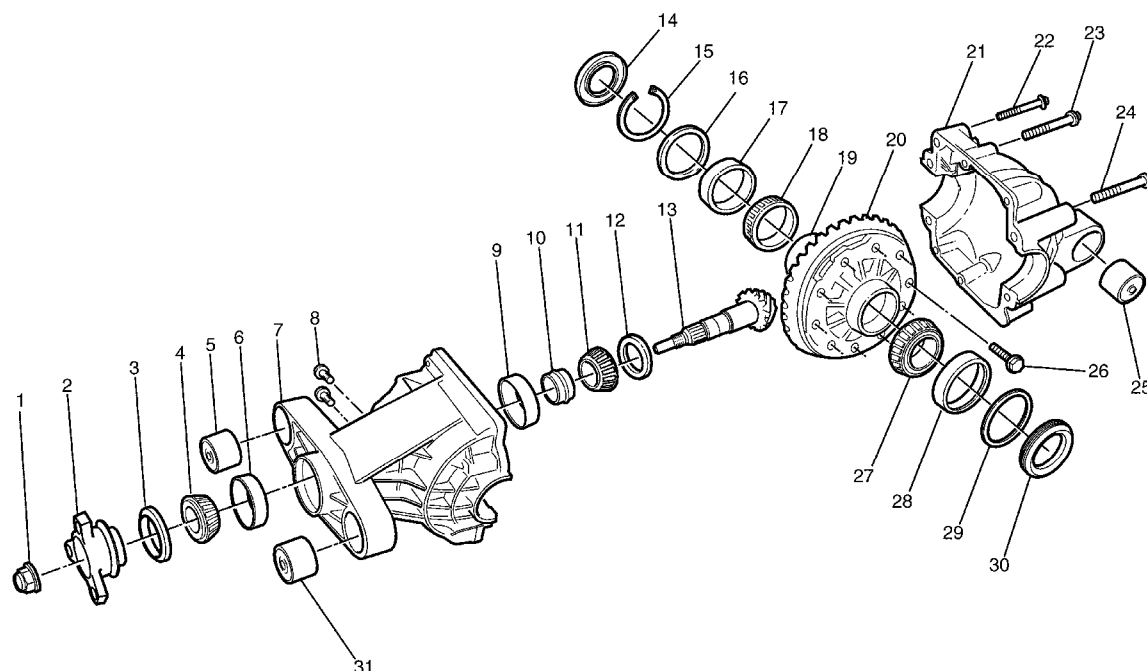
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Adhesives, Fluids, Lubricants, and Sealers

Application	Type of Material	Description
Prevailing Torque Pinion Flange Nut	Thread Locker	Loctite 2701 (Alternative Loctite 648)
Input and Output Seals	Grease	Mobil Grease XHD 222
Differential Housing	Sealant	Loctite 5910

Rear Axle Disassembled Views

Differential



- (1) Prevailing Torque Pinion Flange Nut
- (2) Pinion Flange
- (3) Pinion Flange Oil Seal
- (4) Pinion Tail Bearing
- (5) Right Front Bushing
- (6) Pinion Tail Bearing Cup
- (7) Differential Housing
- (8) Drain/Fill Plugs
- (9) Pinion Head Bearing Cup
- (10) Collapsible Spacer
- (11) Pinion Head Bearing
- (12) Pinion Shim
- (13) Pinion Gear
- (14) Right Axle Shaft Seal
- (15) Circlip
- (16) Right Shim
- (17) Differential Bearing Cup

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- (18) Differential Bearing
- (19) Differential Assembly
- (20) Ring Gear
- (21) Differential Housing Cover
- (22) Differential Retaining Bolt M10 (6x)
- (23) Differential Housing Bolt M14 x 135mm (2x)
- (24) Differential Housing Bolt M14 x 100mm (2x)
- (25) Rear Bushing
- (26) Ring Gear Bolts M12 (10x)
- (27) Differential Bearing
- (28) Differential Bearing Cup
- (29) Left Shim
- (30) Axle Shaft Seal
- (31) Left Front Bushing

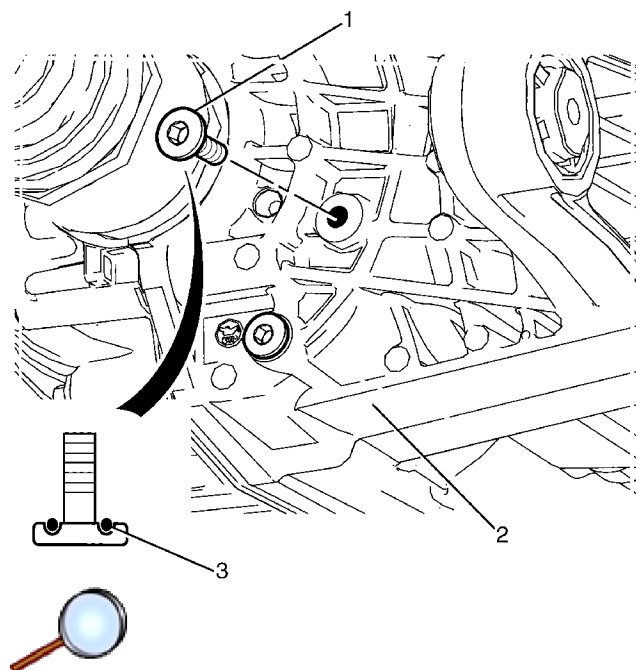
Rear Axle Lubricant Level Inspection

Inspection Procedure

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .



Important: The differential fill plug (1) and O-ring (3) come as an assembly, the O-ring (3) cannot be replaced separately.

Important: Clean the area around the differential fill plug (1) to prevent the entry of foreign particles into the differential (2).

2. Remove the differential fill plug (1) from the differential (2).
3. Inspect the differential fill plug (1) and O-ring (3) for excessive wear and/or damage. Replace as necessary.

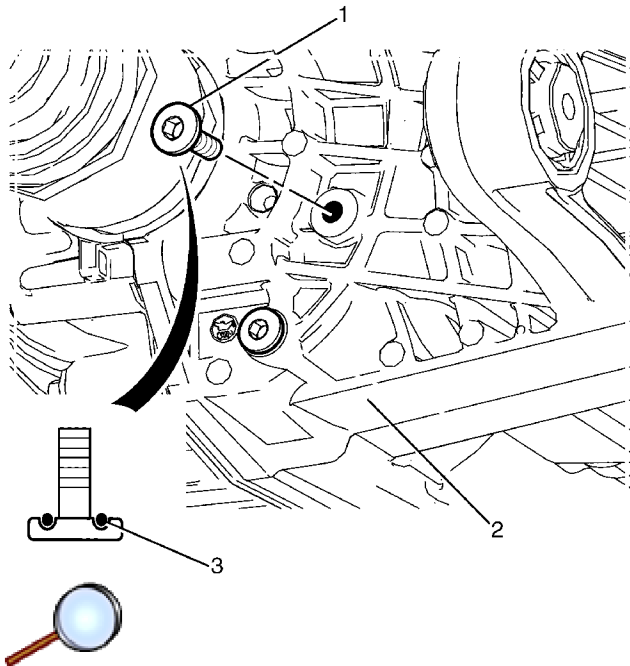
Important: The differential fluid level must be level with the bottom of the differential fill plug hole to no lower than 6 mm (0.25 in) below the opening.

Important: When adding differential fluid or making a complete differential fluid change, always use the correct differential fluid. Failure to use the correct differential fluid may cause gear damage and/or differential fluid leaks. For differential fluid specifications refer to [Lubrication Specifications](#) .

4. Check the differential fluid level.
5. Add new differential fluid if necessary.

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Notice: Refer to [Fastener Notice](#) in the Preface section.



6. Install the differential fill plug (1) and O-ring (3) to the differential (2).

Tighten

Tighten the differential fill plug to 35 N-m (26 lb ft).

7. Remove the safety stands.
8. Lower the vehicle to the ground.

Differential Carrier Bushing Replacement - Rear

Tools Required

[AU-592](#) Bushing Remover/Installer.

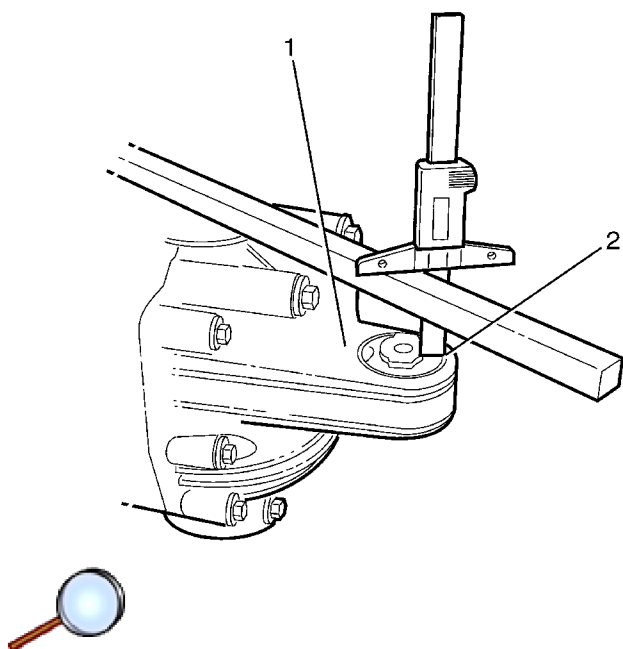
Important: All three bushings of the differential are different although they appear the same. Make sure that the correct part number is used. Mount orientation is critical for noise and vibration performance.

Removal Procedure-Rear Differential Carrier Assembly Bushing

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

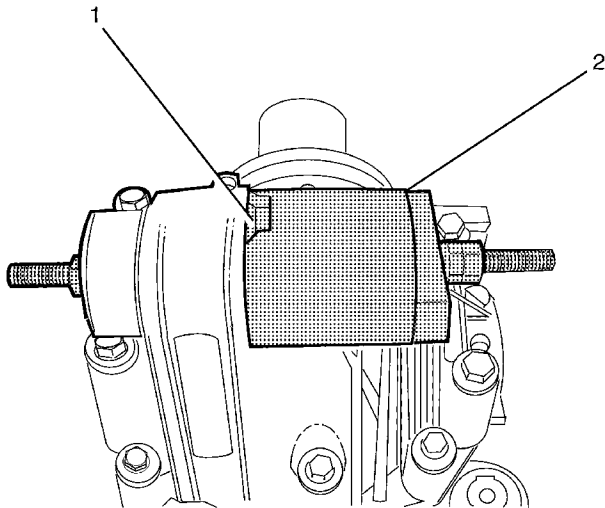
Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove both rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#) .
3. Disconnect the propeller shaft and rubber coupling from the differential flange. Refer to [Propeller Shaft Replacement](#) .
4. Remove the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
5. Remove both wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#) .
6. Remove the differential assembly. Refer to [Differential Replacement](#) .



Important: Observe and mark the orientation of the rear bushing (1) with reference to the original position. This recommendation will minimise the potential of incorrect rear bushing installation.

7. Measure the installation depth of the rear bushing (2) in relation to the differential (1).

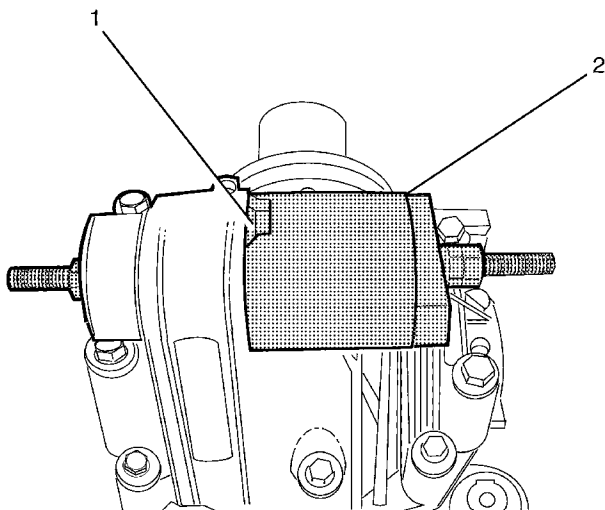


Important: The rear bushing (1) is a single use part and must be discarded after use.

8. Remove the rear bushing (1) from the differential using [AU-592](#) (2).

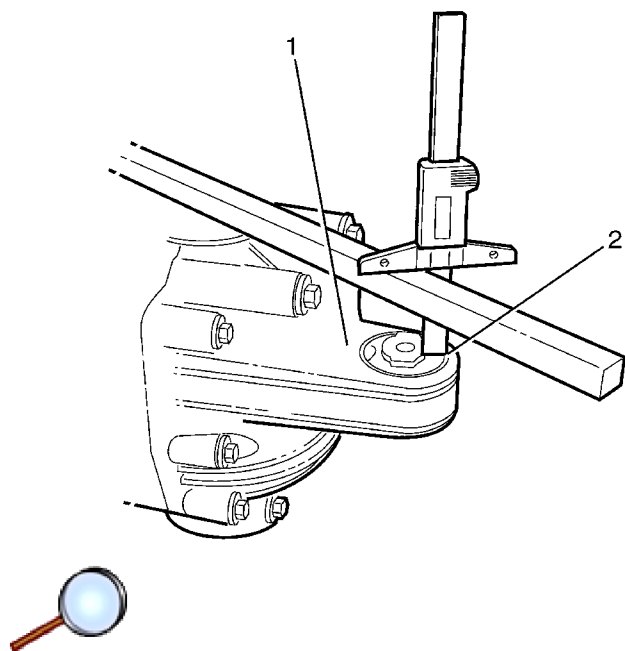
Discard the rear bushing.

Installation Procedure-Rear Differential Carrier Assembly Bushing



Important: Before installing, the rear bushing (1) must be correctly aligned and oriented. Mount orientation is critical for noise and vibration performance. The depth to which the bushing is going to travel must also be maintained.

1. Pull the rear bushing (1) into the differential using the [AU-592](#) (2).



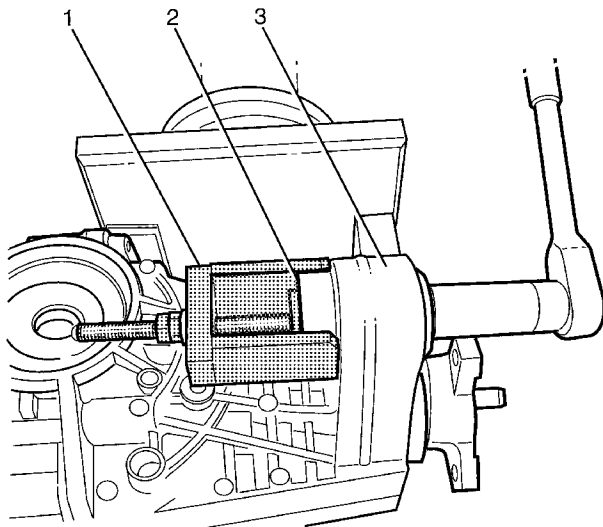
2. Pull the rear bushing (2) into the differential (1) until the measured installation depth is reached.
3. Install the differential assembly. Refer to [Differential Replacement](#).
4. Connect the propeller shaft and rubber coupling to the differential flange. Refer to [Propeller Shaft Replacement](#).
5. Install the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#).
6. Install both wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#).
7. Install both rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
8. Remove the safety stands.
9. Lower the vehicle to the ground.

Removal Procedure-Front Right Differential Carrier Assembly Bushing

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove both rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
3. Disconnect the propeller shaft and rubber coupling from the differential flange. Refer to [Propeller Shaft Replacement](#).
4. Remove the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#).
5. Remove both wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#).
6. Remove the differential assembly. Refer to [Differential Replacement](#).



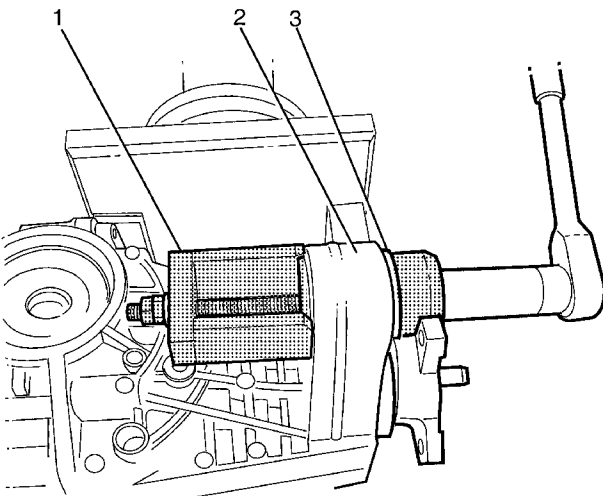
Important: Observe and mark the orientation of the bushing with reference to the original position. This will minimise the potential of incorrect bushing installation.

Important: The front right bushing (2) is a single use part and must be discarded after use.

7. Remove the front right bushing (2) from the differential (3) using [AU-592](#) (1).

Discard the bushing.

Installation Procedure-Front Right Differential Carrier Assembly Bushing





Important: Before installing, the front right bushing (3) must be correctly aligned and oriented. Mount orientation is critical for noise and vibration performance.

1. Pull the front right bushing (3) to the differential (2) using [AU-592](#) (1).
2. Pull the front right bushing (3) until it is flush fitted.
3. Install the differential assembly. Refer to [Differential Replacement](#) .
4. Connect the propeller shaft and rubber coupling to the differential flange. Refer to [Propeller Shaft Replacement](#) .
5. Install the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
6. Install the wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#) .
7. Install the rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#) .
8. Remove the safety stands.
9. Lower the vehicle to the ground.

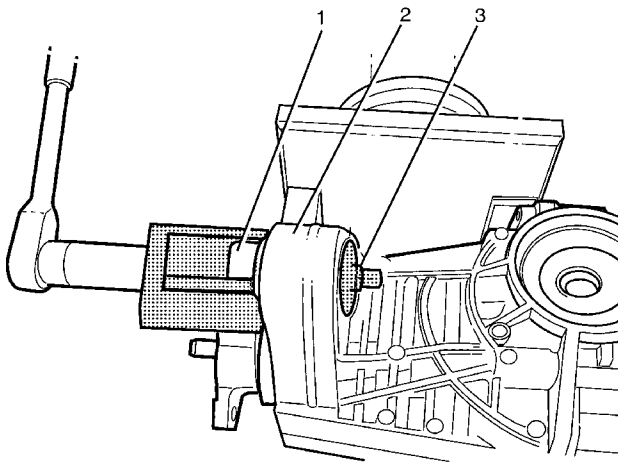
Removal Procedure-Front Left Differential Carrier Assembly Bushing

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

Important: The left differential carrier bushing has to be pressed in the opposite direction to the right due to clearance.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#) .
3. Disconnect the propeller shaft and rubber coupling from the differential flange. Refer to [Propeller Shaft Replacement](#) .
4. Remove the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
5. Remove the wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#) .
6. Remove the differential assembly. Refer to [Differential Replacement](#) .





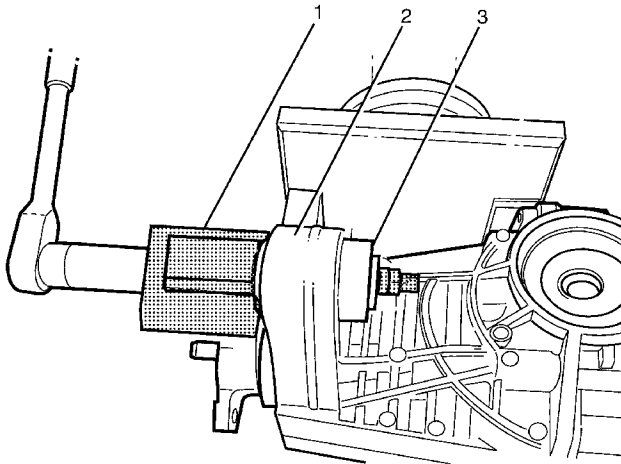
Important: Observe and mark the orientation of the bushing with reference to the original position. This will minimise the potential of incorrect bushing installation.

Important: The front left front bushing (1) is a single use part and must be discarded after use.

7. Remove the front left bushing (1) from the differential (2) using [AU-592](#) (3).

Discard the bushing.

Installation Procedure-Front Left Differential Carrier Assembly Bushing



Important: Before installing, the bushing (1) must be correctly aligned and oriented. Mount orientation is critical for noise and vibration performance.

1. Pull the front left bushing (3) to the differential (2) using [AU-592](#) (1).
2. Pull the front left bushing (3) until it is flush fitted.
3. Install the differential assembly. Refer to [Differential Replacement](#) .
4. Connect the propeller shaft and rubber coupling to the differential flange. Refer to [Propeller Shaft Replacement](#) .
5. Install the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
6. Install the wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#) .
7. Install the rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#) .
8. Remove the safety stands.
9. Lower the vehicle to the ground.

Rear Axle Shaft Seal Replacement - Outer

Tools Required

- [E-308](#) Seal Remover.
- [DT-48722](#) Left Seal Installer.
- [DT-48721](#) Right Seal Installer.

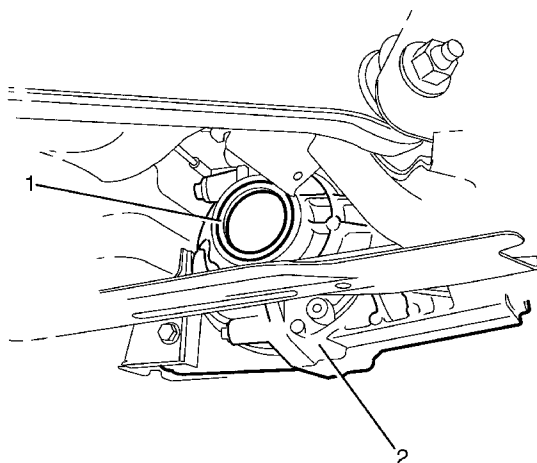
Removal Procedure

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

Important: The left and right axle shaft seals are different sizes. Make sure the correct part number is used.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the rear wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
3. Place a large suitable container under the differential in order to collect draining fluid.
4. Remove the wheel drive shaft assembly. Refer to [Wheel Drive Shaft Replacement](#).



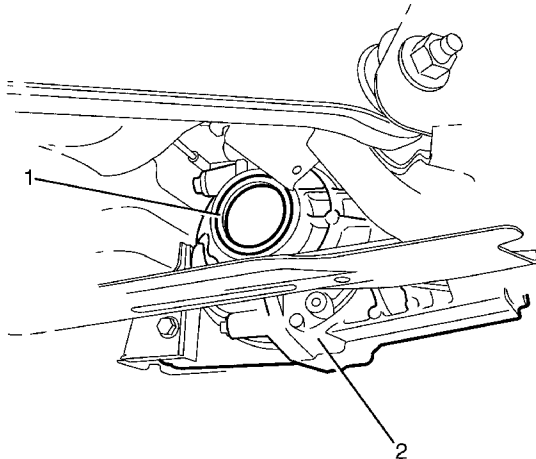
Important: Do not damage any sealing surfaces when removing the axle shaft oil seal (1). Cuts or abrasions will damage the assembly and result in lubricant leakage from this area.

Important: The axle shaft oil seal (1) is a single use part and must be discarded after removal.

5. Use [E-308](#) to remove the axle shaft oil seal (1) from the differential (2).

Discard the axle shaft oil seal.

Installation Procedure



Important: The left and right axle shaft oil seals are different sizes.

Important: Do not damage any sealing surfaces when installing the axle shaft oil seal (1). Cuts or abrasions will damage the assembly and result in lubricant leakage from this area.

1. Lubricate the NEW axle shaft oil seal (1) with correct grease. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#).

Important: Use [DT-48722](#) for the left seal or [DT-48721](#) for the right seal to install seals to the correct depth.

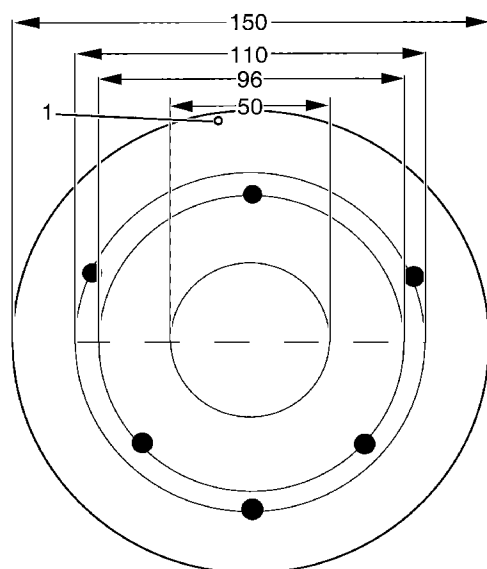
2. Install the axle shaft oil seal (1) to the differential (2).
3. Install the wheel drive shaft to the vehicle. Refer to [Wheel Drive Shaft Replacement](#).
4. Install the rear wheel assembly. Refer to [Tire and Wheel Removal and Installation](#).
5. Check differential fluid. Refer to [Rear Axle Lubricant Level Inspection](#).
6. Remove the safety stands.
7. Lower the vehicle to the ground.

Drive Pinion Flange / Yoke and /or Oil Seal Replacement

Tools Required

- [E-308](#) Seal Remover.
- [DT-48727](#) Seal Installer.
- [6613](#) Universal Pulley Holder OTC.

Removal Procedure -- Pinion Flange



1. A pre-fabricated tool will need to be made prior to starting this procedure. Follow the steps below:
 - Make from a 13mm piece of wood.
 - Drill a hole at (1) and attach a one metre length of string at this point, knotted at one end.
 - Drill three 8.5mm holes at a PCD of 96mm and 120 degrees apart.
 - Drill three 8.5mm holes at a PCD of 110mm and 120 degrees apart.
 - Drill a 50mm hole in the centre of the tool.

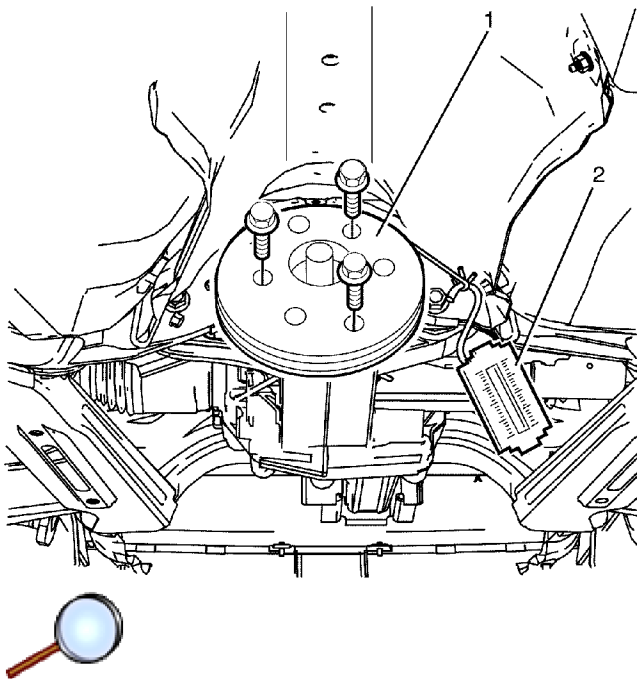
Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

2. Raise and support vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#).

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4. Remove the rear tyre and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
5. Disconnect the propeller shaft and rubber coupling from the differential pinion flange. Refer to [Propeller Shaft Replacement](#).
6. Secure the propeller shaft with a wire to protect it from damage.



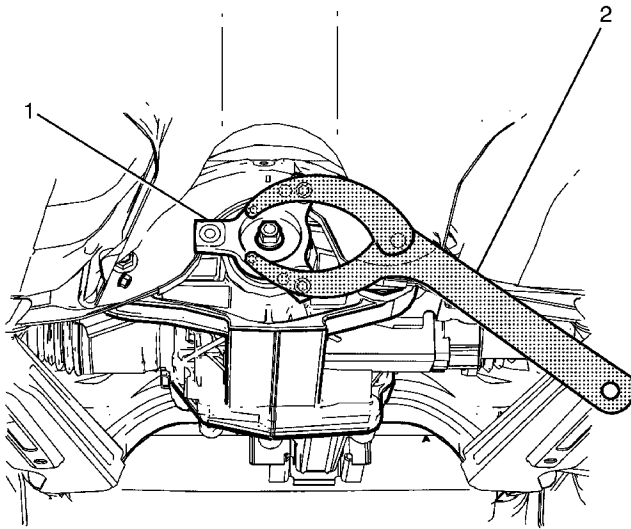
Important: Make sure that the hand brake is off and the brake rotors freely rotate.

7. Install the pre-fabricated tool (1) to the pinion flange.
8. Attach the spring balance (2) to the string of the pre-fabricated tool (1).

Important: The torque reading will different for in and out of the vehicle measurement.

Important: The torque reading is required to correctly reset pinion pre-load on assembly.

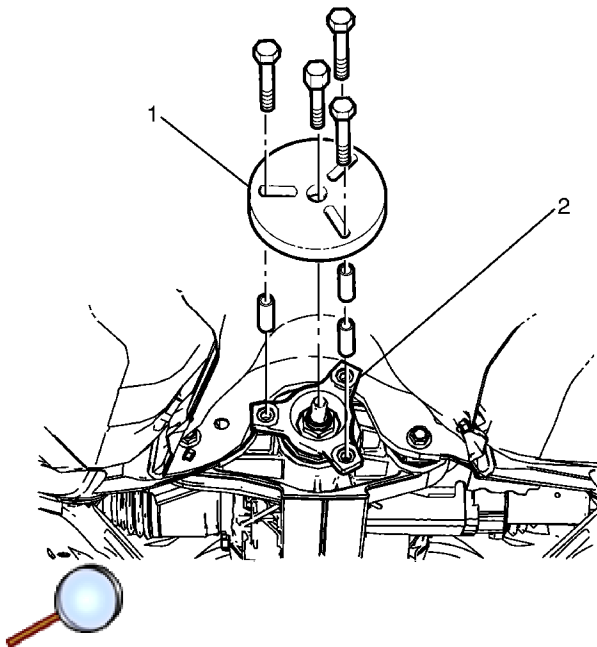
9. Pull the spring balance (2) and record the reading.
 - Example:
 - With a pulley diameter of 150 mm, the radius is 75 mm, which equals .075 m. With a spring balance reading of 25 N, the pre-load equals $.075 \text{ m} \times 25 \text{ N} = 1.875 \text{ N.m}$.



10. Install the [6613](#) (2) to the pinion flange (1).
11. While holding the [6613](#) (2) remove the prevailing torque pinion flange retaining nut from the differential.

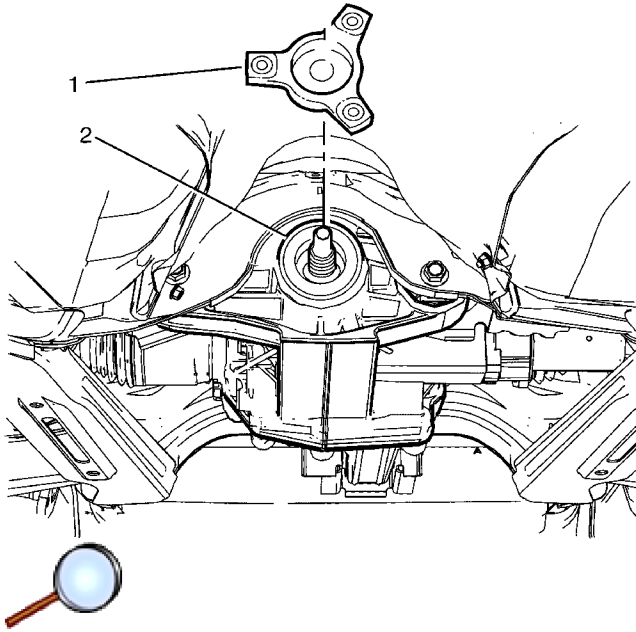
Discard the prevailing torque pinion flange retaining nut.

12. Remove the [6613](#) (2) from the pinion flange (1).



Important: Use a suitable puller (1) to remove the pinion flange (2).

13. Install the puller (1) to the pinion flange (2).
14. Place a large suitable container under the differential in order to collect draining fluid.
15. Use the puller (1) to remove the pinion flange (2).



16. Remove the pinion flange (1) from the differential (2).

Important: The pinion flange oil seal should be replaced when replacing the pinion flange.

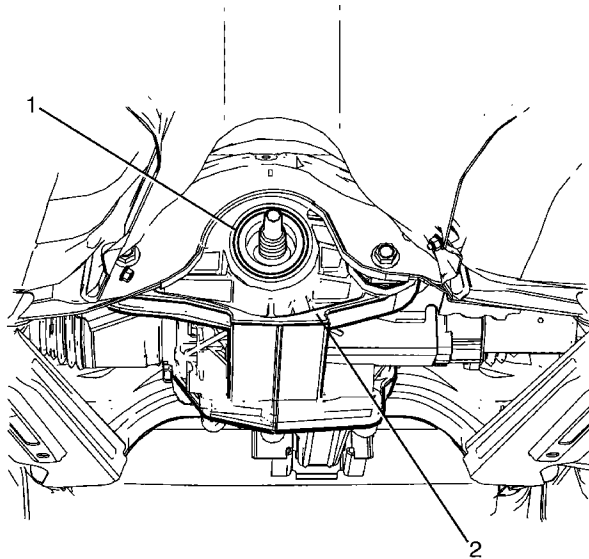
17. Check the pinion flange oil seal for wear and/or damage. Replace if necessary.

Removal Procedure -- Oil Seal

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

1. Raise and support vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
3. Disconnect the propeller shaft and rubber coupling from the differential flange. Refer to [Propeller Shaft Replacement](#) .
4. Remove the differential pinion flange. Refer to [Drive Pinion Flange/Yoke and/or Oil Seal Replacement](#) .



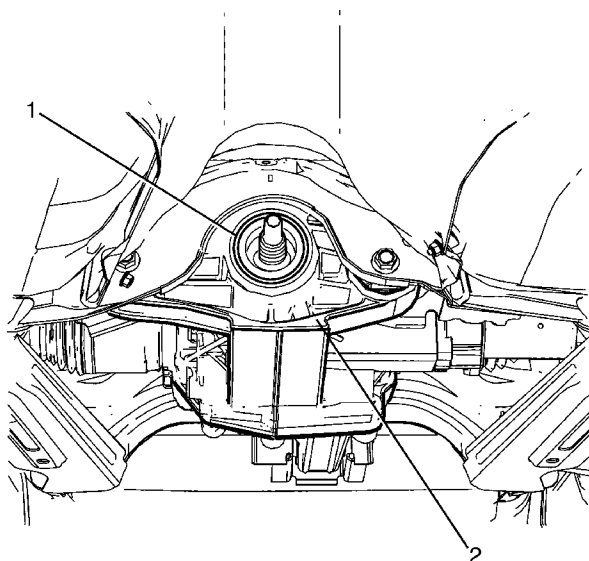
Important: Do not damage any sealing surfaces when removing the pinion flange oil seal (1). Cuts or abrasions will damage the assembly and result in lubricant leakage from this area.

Important: The pinion flange oil seal (1) is a single use part and must be discarded after use.

5. Use [E-308](#) to remove the pinion flange oil seal (1) from the differential (2).

Discard the pinion flange oil seal.

Installation Procedure -- Oil Seal





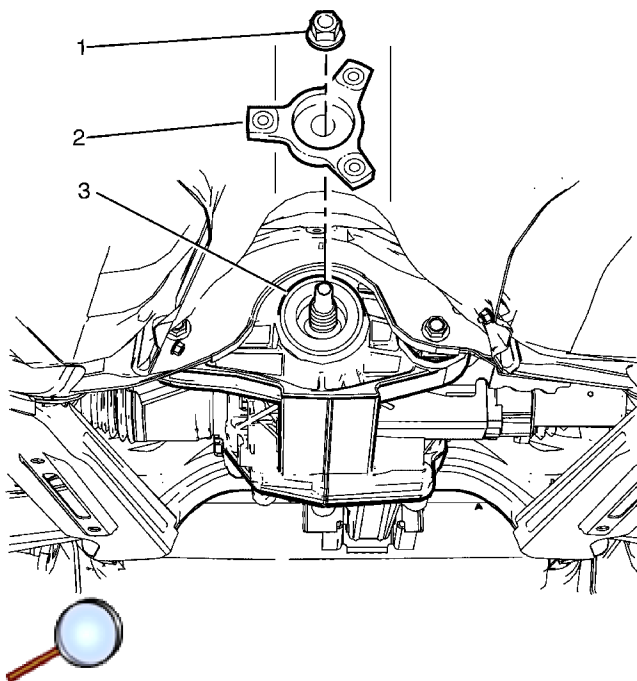
1. Lubricate the NEW pinion flange oil seal (1) with the correct grease. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#) .

Important: Do not damage any sealing surfaces when fitting the pinion flange oil seal. Cuts or abrasions will damage the assembly and result in lubricant leakage from this area.

Important: Use [DT-48727](#) to obtain correct seal depth.

2. Install the NEW pinion flange oil seal (1) to the differential (2) with [DT-48727](#) .
3. Install the pinion flange. Refer to [Drive Pinion Flange/Yoke and/or Oil Seal Replacement](#) .
4. Connect the propeller shaft and rubber coupling to the differential flange. Refer to [Propeller Shaft Replacement](#) .
5. Install the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
6. Check differential fluid. Refer to [Rear Axle Lubricant Level Inspection](#) .
7. Remove safety stands.
8. Lower the vehicle to the ground.

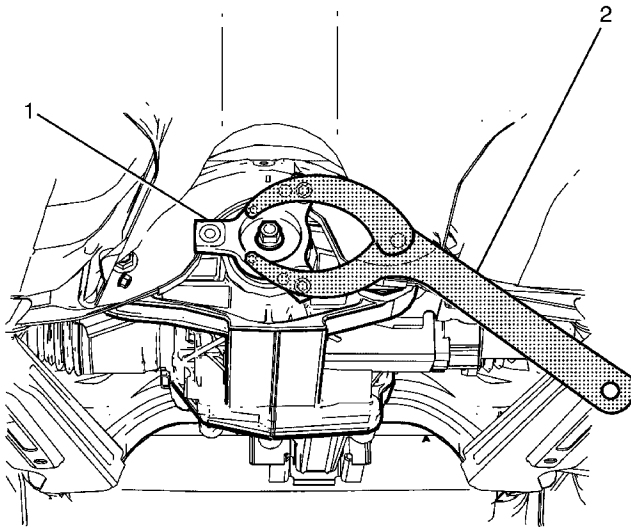
Installation Procedure -- Pinion Flange



1. Position the pinion flange (2) to the differential (3).
2. Lubricate the contact surface of the NEW prevailing torque pinion flange retaining nut (1) with correct grease. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#) .
3. Apply loctite 2701 (alternative loctite 648) to the thread of the NEW prevailing torque pinion flange retaining nut (1).

Important: Do not fully tighten the NEW prevailing torque pinion flange retaining nut at this stage.

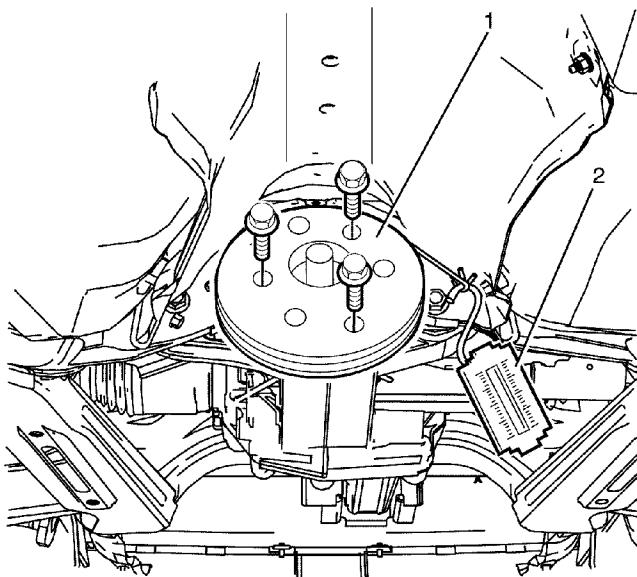
4. Install the NEW prevailing torque pinion flange retaining nut (1) to the differential (3).



5. Install the [6613](#) (2) to the pinion flange (1).

Important: Do NOT over tighten the NEW prevailing torque pinion flange retaining nut. If the prevailing torque pinion flange retaining nut is over tightened the differential will have to be disassembled.

6. Tighten the NEW prevailing torque pinion flange retaining nut carefully until the pinion flange has no play.
7. Remove the [6613](#) (2) from the pinion flange (1).



Important: The torque reading will different for in and out of the vehicle measurement.

8. Install the pre-fabricated tool (1) to the pinion flange.

9. Attach the spring balance (2) to the string of the pre-fabricated tool (1).
10. Turning torque must be equal to the value recorded in the removal procedure.

Important: Do NOT over tighten the prevailing torque pinion flange retaining nut. If the prevailing torque pinion flange retaining nut is over tightened the differential will have to be disassembled.

11. If the turning torque is below the value recorded in the removal procedure, tighten the NEW prevailing torque pinion flange retaining nut in small steps and check turning torque until specified turning torque is reached.
12. If the turning torque is above the value recorded in the removal procedure a NEW collapsible spacer must be fitted. Refer to [Rear Axle Disassembled Views](#) .
13. Make sure the pinion gear is free from excessive Loctite.
14. Install the propeller shaft and rubber coupling to differential flange retaining bolts. Refer to [Propeller Shaft Replacement](#)
15. Install the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#) .
16. Check differential fluid level. Refer to [Rear Axle Lubricant Level Inspection](#) .
17. Remove safety stands.
18. Lower the vehicle to the ground.

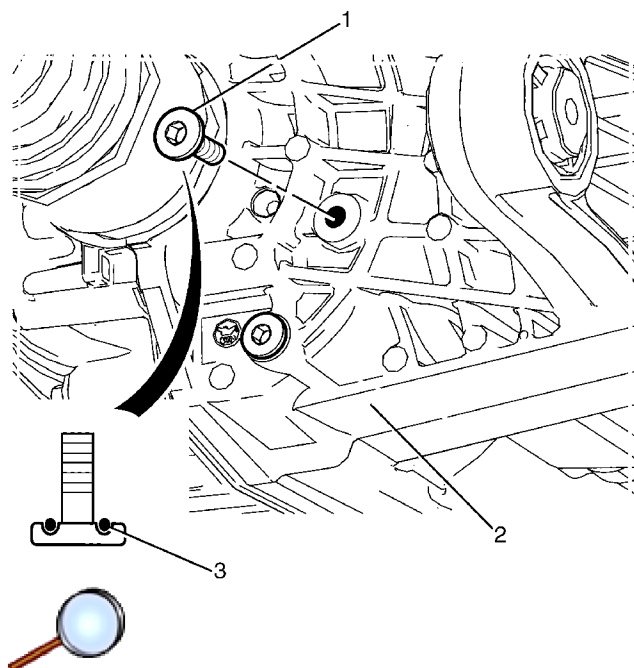
Differential Oil Replacement

Draining Procedure

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

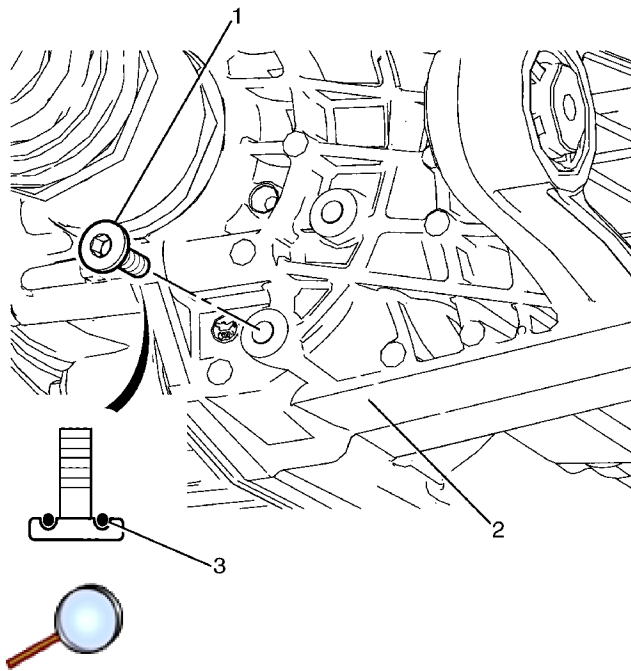
1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Place a large suitable container under the differential in order to collect draining differential fluid.



Important: Clean the area around the differential plug (1) to prevent the entry of foreign particles into the differential (2).

Important: The differential fill plug (1) and O-ring (3) come as an assembly, the O-ring (3) cannot be replaced separately.

3. Remove the differential fill plug (1) from the differential (2).
4. Inspect the differential fill plug (1) and O-ring (3) for excessive wear and/or damage. Replace as necessary.



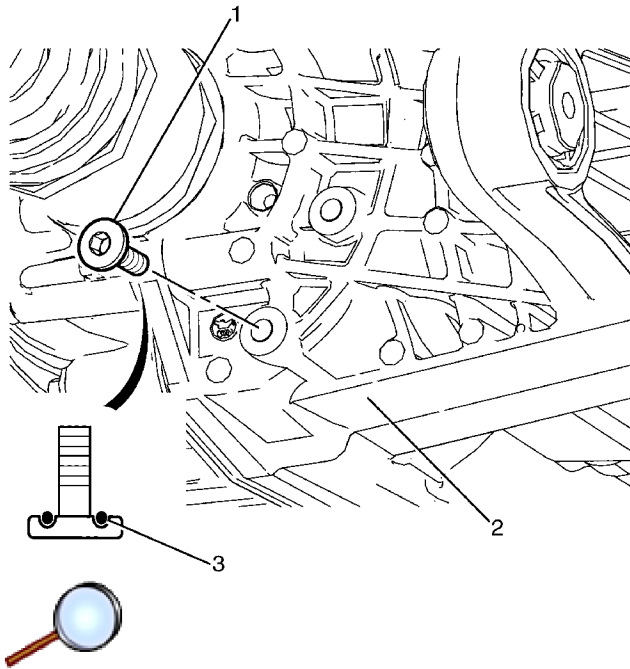
Important: Clean the area around the differential plug (1) to prevent the entry of foreign particles into the differential (2).

Important: The differential drain plug (1) and O-ring (3) come as an assembly, the O-ring (3) cannot be replaced separately.

5. Remove the differential drain plug (1) from the differential (2).
6. Inspect the differential drain plug (1) and O-ring (3) for excessive wear and/or damage. Replace as necessary.
7. Allow the differential fluid to drain completely.

Filling Procedure

Notice: Refer to [Fastener Notice](#) in the Preface section.



1. Install the differential drain plug (1) and O-ring (3) to the differential (2).

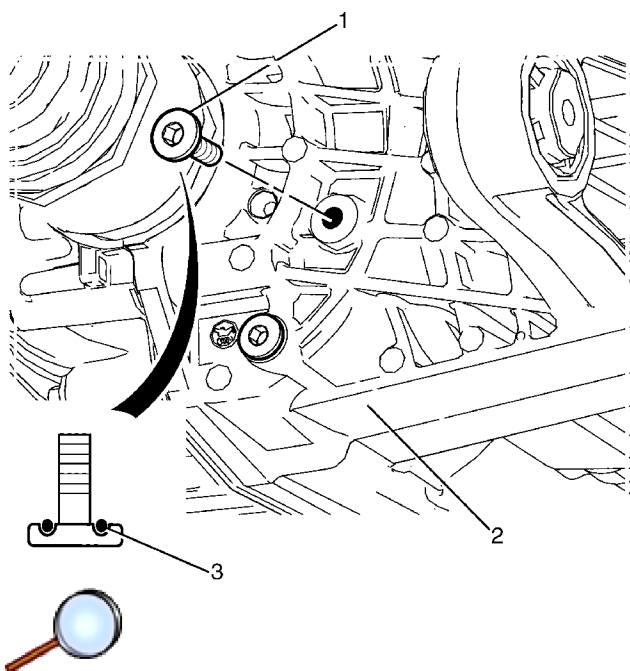
Tighten

Tighten the differential drain plug to 35 N-m (26 lb ft).

Important: When adding fluid or making a complete fluid change, always use the correct differential fluid. Failure to use the correct fluid may cause gear damage and/or fluid leaks. For fluid specifications refer to [Lubrication Specifications](#).

Important: The differential fluid level must be level with the bottom of the fill plug hole to no lower than 6 mm (0.25 in) below the opening.

2. Fill the differential to the correct level.



3. Install the differential fill plug (1) and O-ring (3) to the differential (2).

Tighten

Tighten the differential fill plug to 35 N-m (26 lb ft).

4. Remove safety stands.
5. Lower the vehicle to the ground.

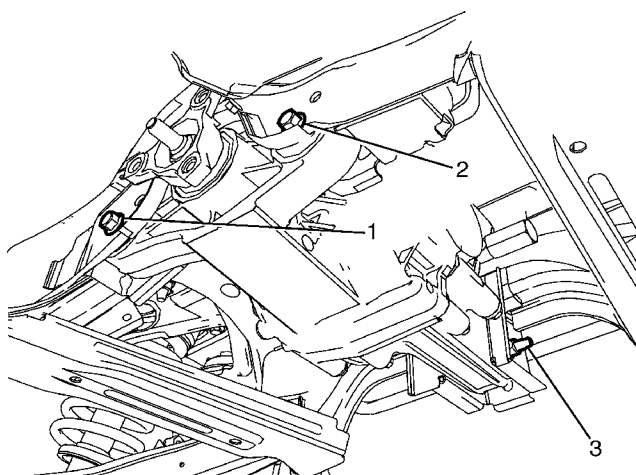
Differential Replacement

Removal Procedure

Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the rear tyre and wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
3. Drain differential oil. Refer to [Differential Oil Replacement](#).
4. Remove the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#).
5. Remove the propeller shaft and rubber coupling from differential flange. Refer to [Propeller Shaft Replacement](#).
6. Remove the wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#).
7. Support the differential with a suitable jack.



Important: Nuts with micro-encapsulated thread sealant are single use parts and must be discarded after removal.

8. Remove the differential retaining bolts and nuts (1), (2) and (3) from the rear suspension.

Important: With a suitable jack support the differential.

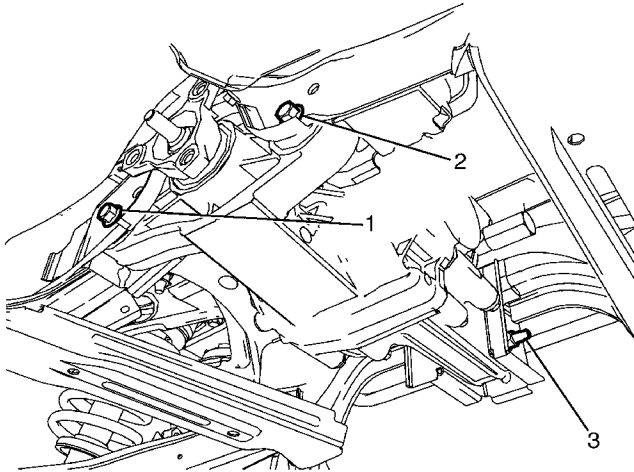
9. Remove the differential from the vehicle.

Installation Procedure

Important: With a suitable jack raise and support the differential.

1. Position the differential to the vehicle.

Notice: Refer to [Fastener Notice](#) in the Preface section.



Important: With a suitable jack support the differential.

2. Install the differential retaining bolts and nuts (1), (2) and (3) to the rear suspension.

Tighten

Tighten the differential to body retaining bolts and nuts (1) to 80 N-m (59 lb ft).

Tighten

Tighten the differential to body retaining bolts and nuts (2) to 100 N-m (74 lb ft).

Tighten

Tighten the differential to body retaining bolts and nuts (3) to 100 N-m (74 lb ft).

3. Install the propeller shaft and rubber coupling to the differential flange. Refer to [Propeller Shaft Replacement](#).
4. Install the wheel drive shaft assemblies. Refer to [Wheel Drive Shaft Replacement](#).
5. Install the intermediate exhaust assembly. Refer to [Exhaust Crossover Pipe Replacement](#).
6. Install the rear wheel assemblies. Refer to [Tire and Wheel Removal and Installation](#).
7. Fill differential oil. Refer to [Differential Oil Replacement](#).
8. Remove the safety stands.
9. Lower the vehicle to the ground.

Rear Axle Disassemble

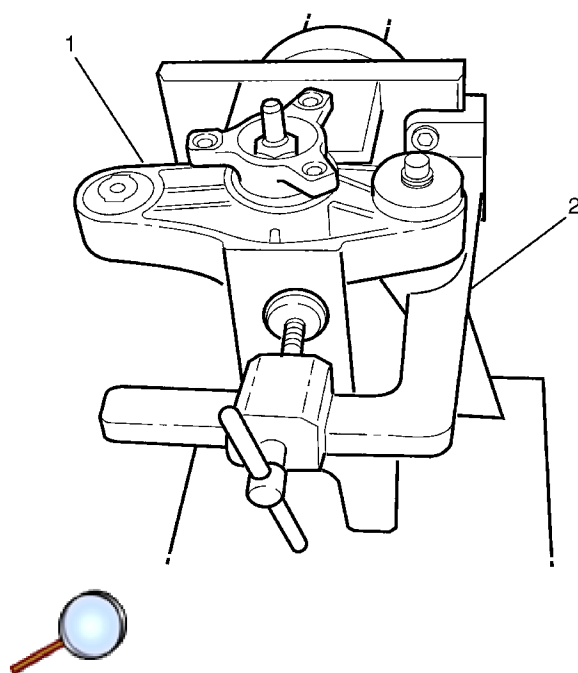
Tools Required

- [E-308](#) Seal Remover.
- [205-116](#) Carrier Bearing Puller Including Plug.
- [DT-48805](#) Pinion Tail Bearing Cup Remover.
- [DT-48725](#) Pinion Head Bearing Cup Removal Kit.
- [DT-48726](#) Pinion Head Bearing Cup Remover.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

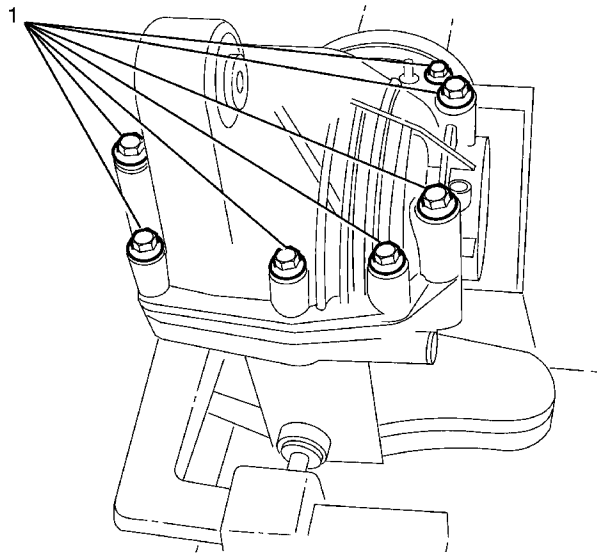
Caution: Refer to [Vehicle Lifting Caution](#) in the Preface section.

1. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Drain the differential fluid. Refer to the draining procedure in [Differential Oil Replacement](#) .
3. Remove the differential from the vehicle. Refer to [Differential Replacement](#) .

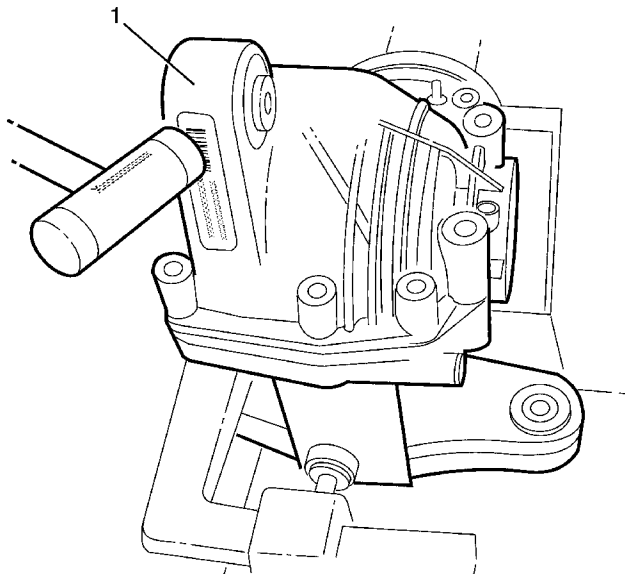


Important: The holding device must be able to rotate.

4. Mount the differential assembly (1) to a suitable holding device (2).

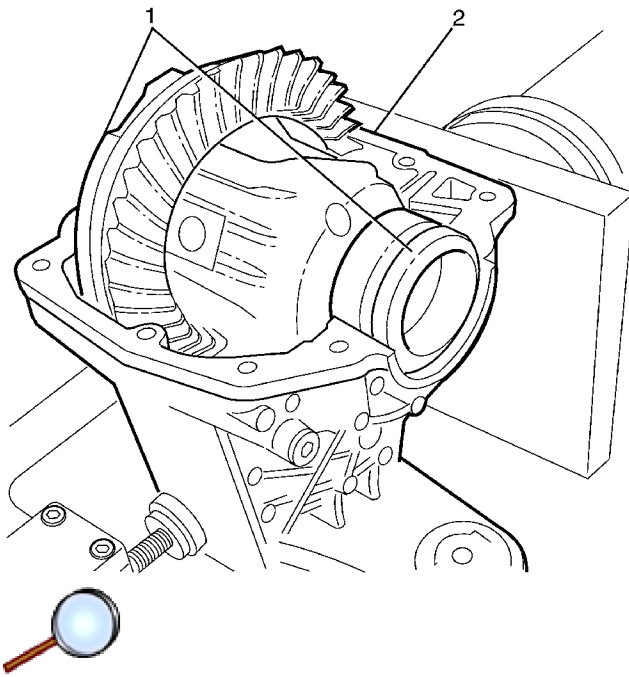


5. Remove the differential housing cover to differential housing retaining bolts (1).



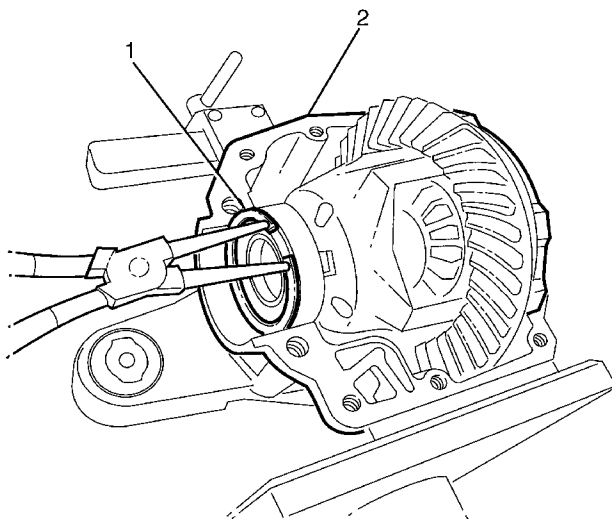
Important: Use a soft faced hammer to aid in separating the differential housing cover from the rear differential housing (1).

6. Remove the rear differential housing cover (1).

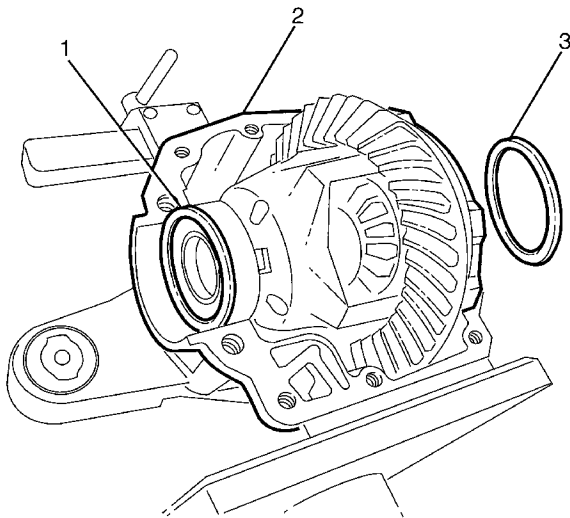


7. Remove the left and right axle shaft seals (1) from the differential (2).

Discard the axle shaft seals.

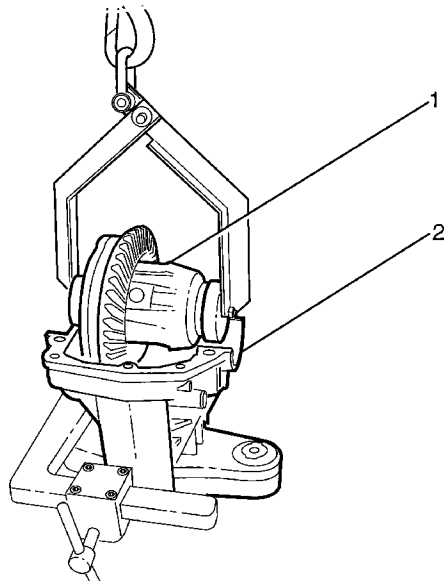


8. Remove the circlip (1) from the differential (2).



Important: Mark the left shim (3) and right shim (1) before removing for correct refitting.

9. Remove the left shim (3) and right shim (1) from the differential (2).

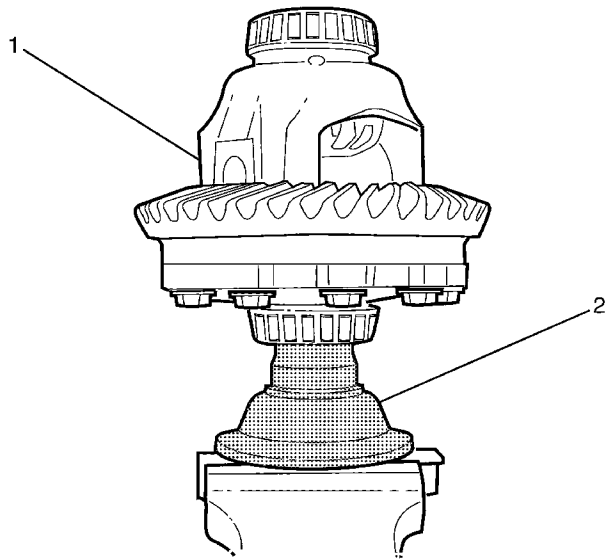


Important: Remove the differential (1) using a suitable tool or with the aid of an assistant.

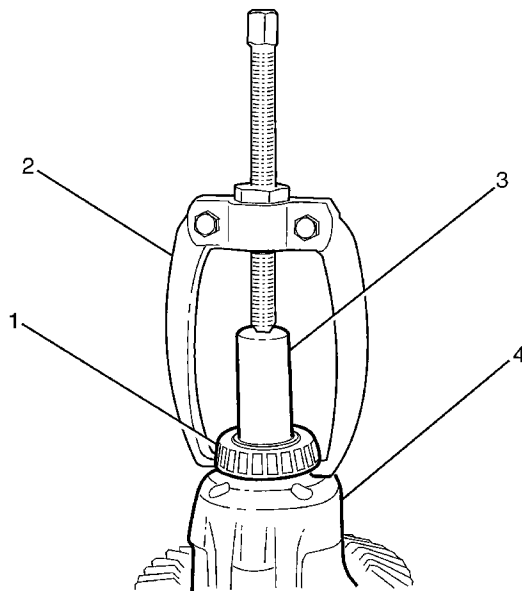
10. Remove the differential (1) from the differential housing (2).

Important: Place a suitable container to catch remaining differential fluid.

11. Allow remaining differential fluid to drain.



12. Position the differential (1) onto a suitable holding device (2).



Important: Use a suitable puller (2) and [205-116](#) (3) to remove the right bearing (1).

13. Remove the right bearing (1) from the differential (4).

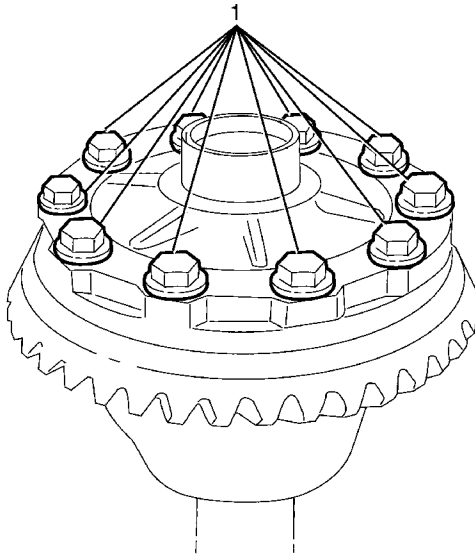
Discard the right bearing.

14. Turn the differential (4) over on the holding tool with the aid of an assistant.

Important: Use a suitable puller (2) and [205-116](#) (3) to remove the left bearing.

15. Remove the left bearing from the differential (4).

Discard the left bearing.



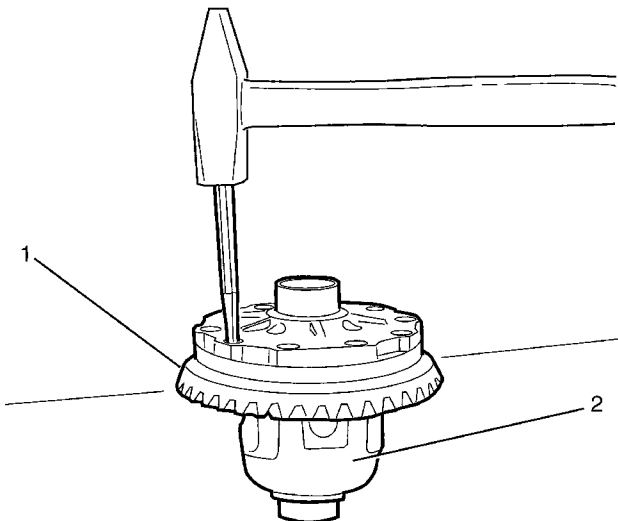
16. Remove the ring gear to differential retaining bolts (1).

Discard ring gear to differential retaining bolts.

17. Remove the differential from the holding device.

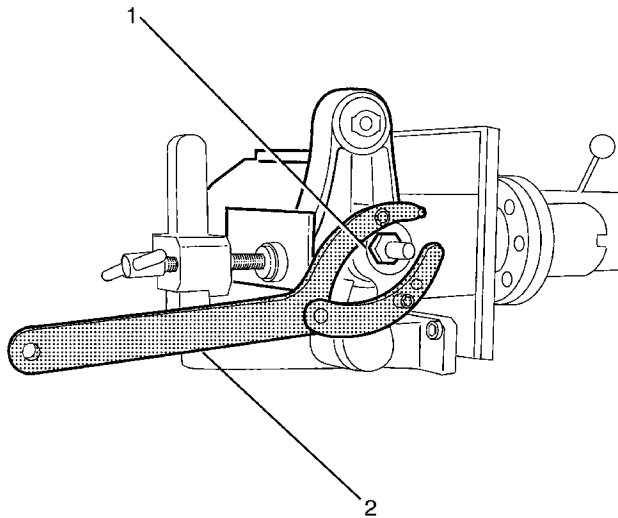
Important: Make sure there is soft material between the differential and the bench top.

18. Place the differential onto a bench top.



Important: Use suitable tools or a suitable press to remove the ring gear (1) from the differential (2). Take care not to damage the ring gear retaining bolt hole threads.

19. Remove the ring gear (1) from the differential (2).



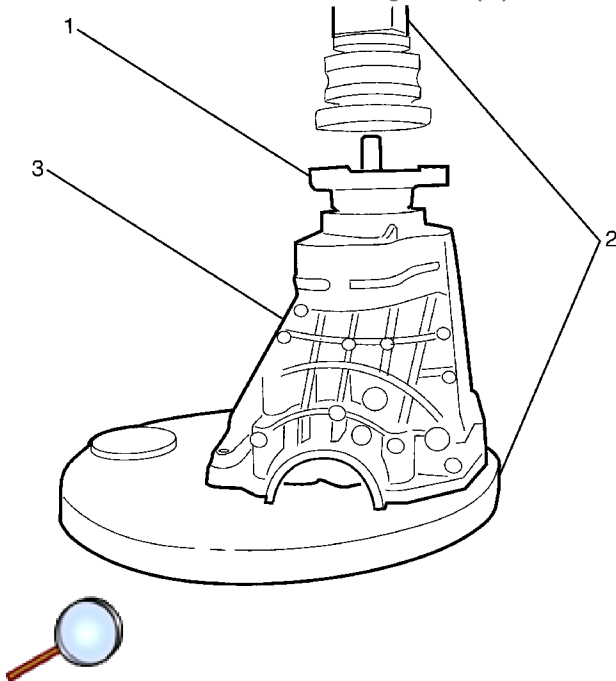
20. Install the universal holding tool (2) to the pinion flange (1).

Important: Hold the pinion flange with universal holding tool (2).

21. Remove the pinion flange to prevailing torque pinion flange retaining nut (1).

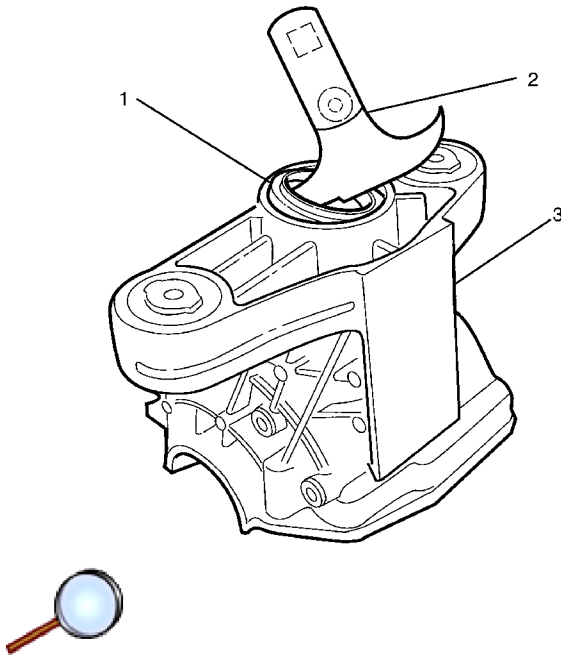
Discard the prevailing torque pinion flange retaining nut.

22. Remove the universal holding tool (2) from the pinion flange (1).



Important: The pinion flange (1) can be removed with a suitable puller or with a press (2). Support the pinion or place a soft cloth under the pinion to prevent damage when removing.

23. Remove the pinion flange (1) from the differential housing (3).
24. Remove the pinion from the differential housing (3).



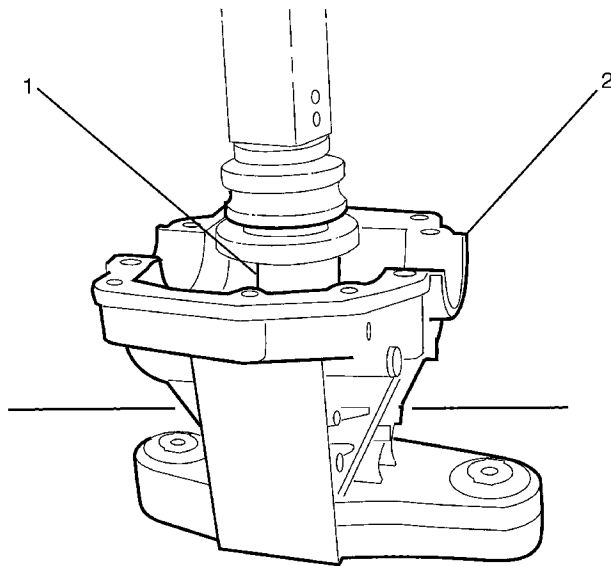
Important: Do not damage any sealing surfaces when removing the axle shaft oil seal (1). Cuts or abrasions will damage the assembly and result in lubricant leakage from this area.

25. Using a [E-308](#) (2), remove the pinion flange oil seal (1) from the differential housing (3).

Discard the pinion flange oil seal.

26. Remove the tail bearing from the differential housing (3).

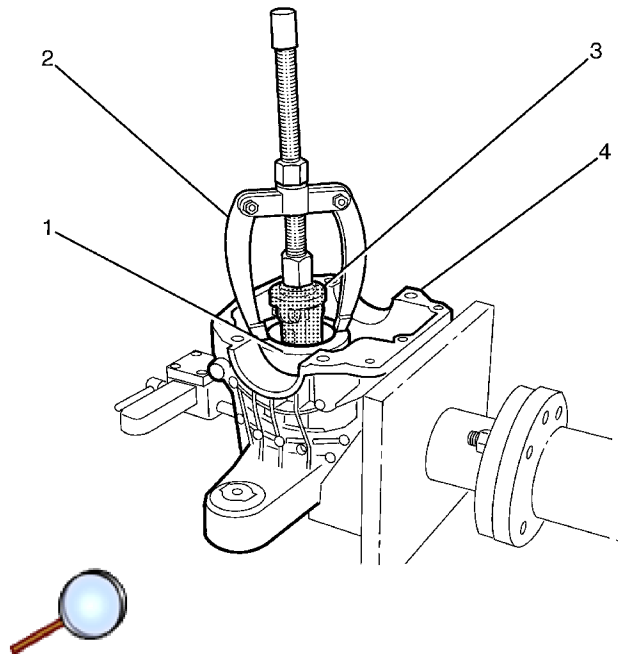
Discard the tail bearing.



Important: Use a suitable press and [DT-48805](#) to remove the tail bearing cup.

27. Position the [DT-48805](#) (1) to the differential housing (2) and press out the tail bearing cup.
28. Remove the tail bearing cup from the differential housing (2).

Discard the tail bearing cup.

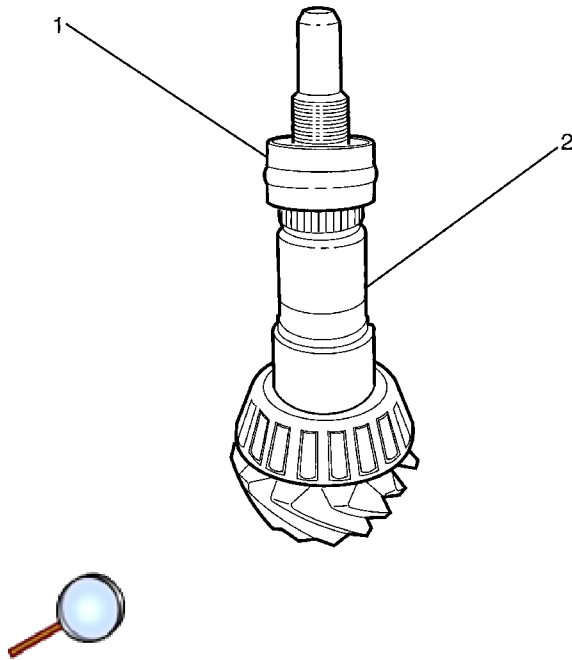


Important: Use [DT-48725](#) (1, 2) and [DT-48726](#) (3) to remove the head bearing cup.

29. Position [DT-48726](#) (3) to the differential housing (4) and pull out the head bearing cup.

30. Remove the head bearing cup from the differential housing (4).

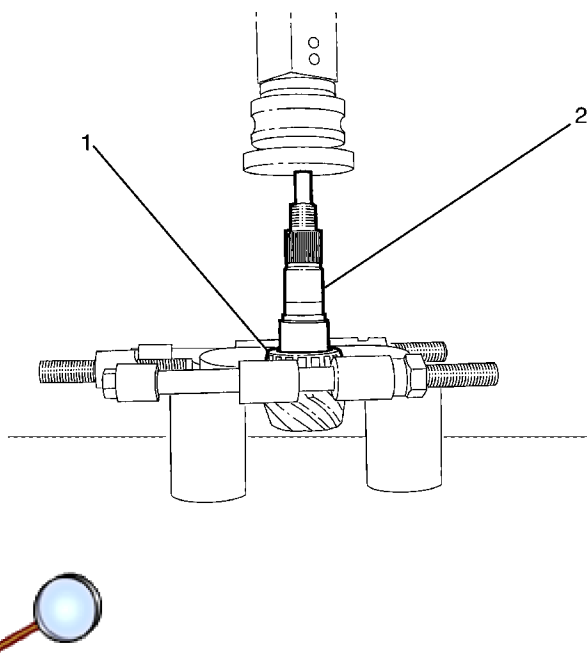
Discard the head bearing cup.



Important: Do not reuse the collapsible spacer (1).

31. Remove the collapsible spacer (1) from the pinion gear (2).

Discard the collapsible spacer.



Important: Use a suitable press and press plates to remove the pinion head bearing (1).

32. Remove the pinion head bearing (1) from the pinion gear (2).

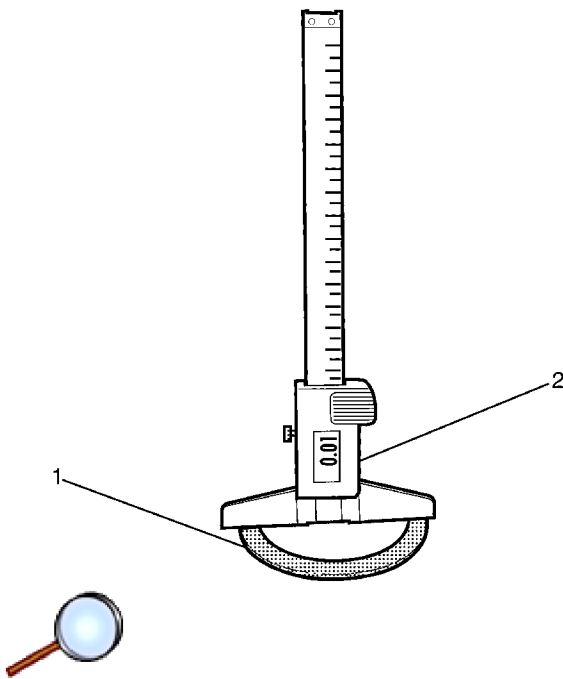
Discard the pinion head bearing.

33. Remove the pinion shim from the pinion gear (2).
34. Clean loctite from the pinion gear thread.

Rear Axle Assemble

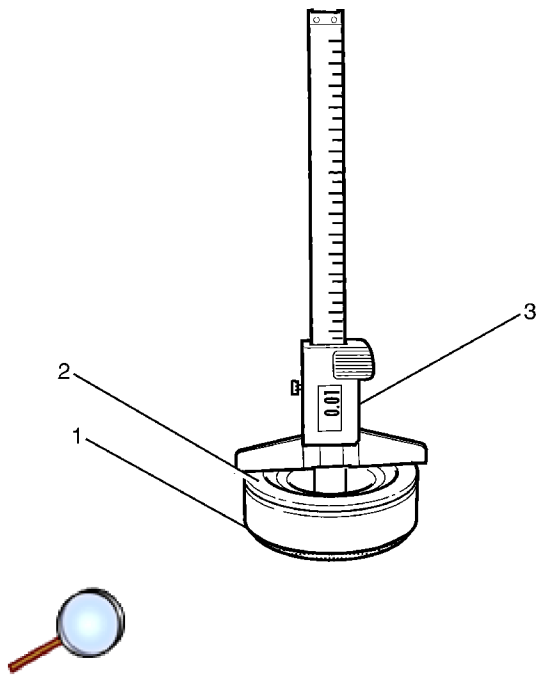
Tools Required

- [DT-48723](#) Pinion Head Bearing Cup Installer.
- [DT-48725](#) Pinion Tail Bearing Cup Installer.
- [DT-48722](#) Left Axle Seal Installer.
- [DT-48721](#) Right Axle Seal Installer.
- [DT-48727](#) Pinion Seal Installer.
- [DT-48728](#) Differential Bearing Installer.
- [DT-48806](#) Pinion Bearing Measurement Spacer.
- [DT-48807](#) Pinion Head Bearing Installer.



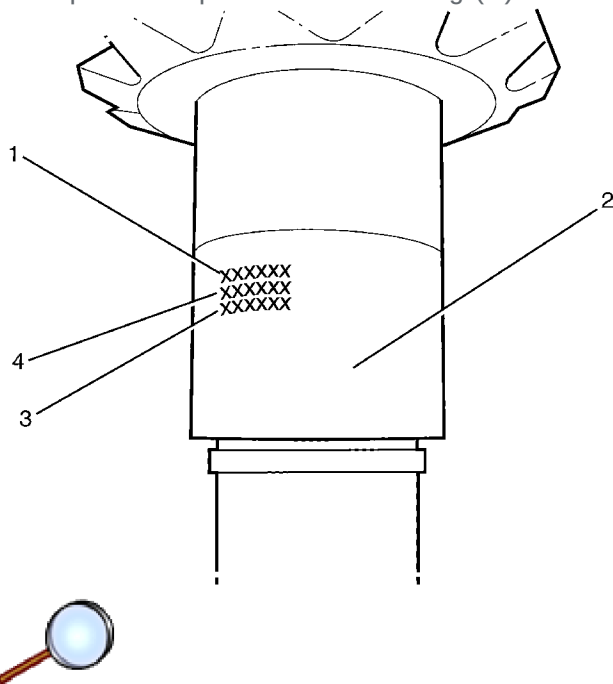
Important: Use [DT-48806](#) otherwise bearing height cannot be measured correctly.

1. Measure the thickness of [DT-48806](#) (1) using a depth gauge (2). (e.g - 3.67mm).
2. Record the thickness of the [DT-48806](#) (1).



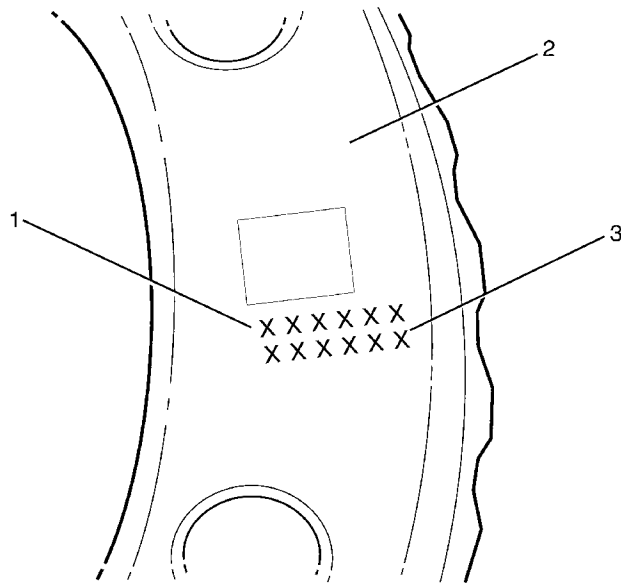
Important: Rotate the pinion head bearing (2) to settle for correct measurement.

3. Measure the thickness of the [DT-48806](#) (1) and the pinion head bearing (2) with the depth gauge (3) (e.g - 33.925mm).
4. Record the thickness of the [DT-48806](#) (1) and pinion head bearing (2).
5. Subtract the thickness of [DT-48806](#) (1) 3.67mm from the total thickness of the pinion bearing measurement spacer (1) and the pinion bearing (2) 33.925mm to determine the pinion head bearing (2) thickness.
6. Example - The pinion head bearing (2) thickness is $33.925\text{mm} - 3.67\text{mm} = 30.255\text{mm}$

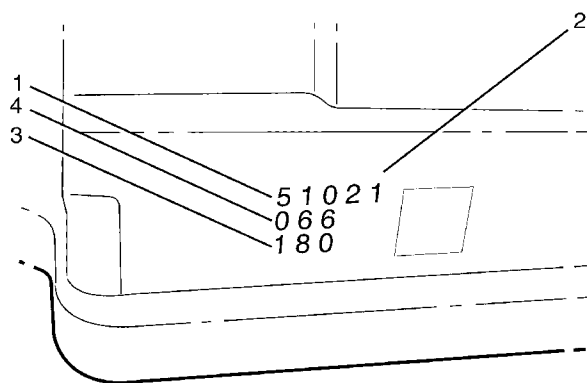


7. Record the serial number (1), set number (3) and size (4) which are stamped into the pinion gear (2).
8. Example:

- Serial Number A0200008 (1)
- Pinion Size 106.475mm (4)
- Set Number 260125 (3)



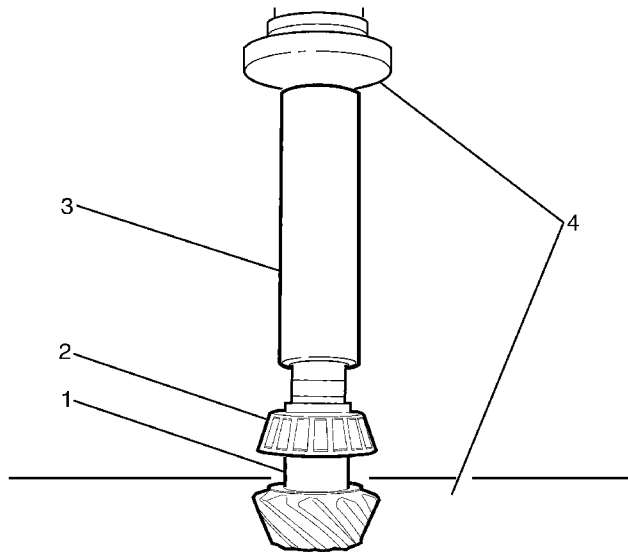
9. Check that the serial number (1) and set number (3) which are stamped into the ring gear (2) match those of the pinion set in step 7.
10. Example:
 - Serial Number A0200008 (1)
 - Set Number 260125 (3)



Important: The identification number (1, 3, and 4) is stamped into the differential housing

(2).

11. Identify the differential housing.
 - Manufacturing date (1).
 - Item number (4).
 - Size equals 138 plus the number on the housing. Example - 138.180mm (3).
12. Record the differential housing size. Example - 138.180mm
13. Determine the thickness of the pinion shim.
 - Add the pinion plus the bearing Example - $106.475\text{mm} + 30.255\text{mm} = 136.730\text{mm}$.
 - Subtract the pinion plus the head bearing from the housing size, also subtract the correction factor. The correction factor is .05mm. Example $138.180 - 136.730 - 0.05 = 1.40\text{mm}$ thickness shim required.
14. Position the correct shim onto the pinion head.



Important: Use [DT-48807](#) (3) to aid in pinion bearing (2) installation.

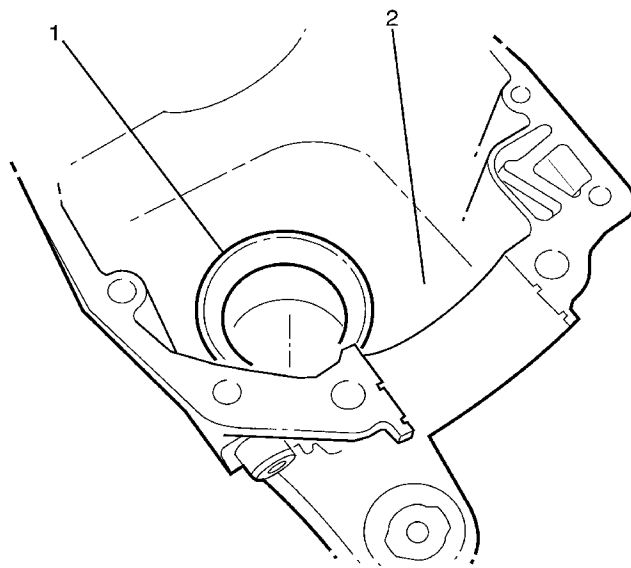
Important: Position the pinion gear (1) onto an aluminium plate in suitable press (4) before pressing the pinion head bearing (2) to prevent damage to the pinion (1).

15. Position the NEW pinion head bearing (2) onto the pinion gear (1).

Important: Use a suitable press (4) to install the NEW differential pinion head bearing (2).

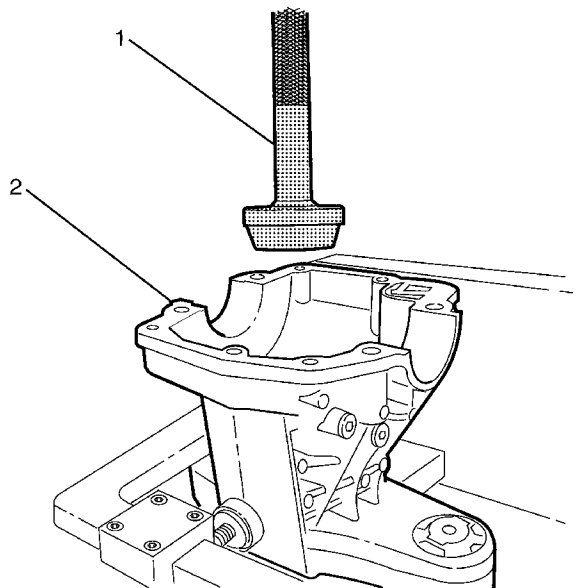
16. Press the NEW pinion head bearing (2) onto the pinion gear using [DT-48807](#) (3).
17. Clean the ring gear and the contact area of the differential.

Caution: Refer to [Safety Glasses Caution](#) in the Preface section.

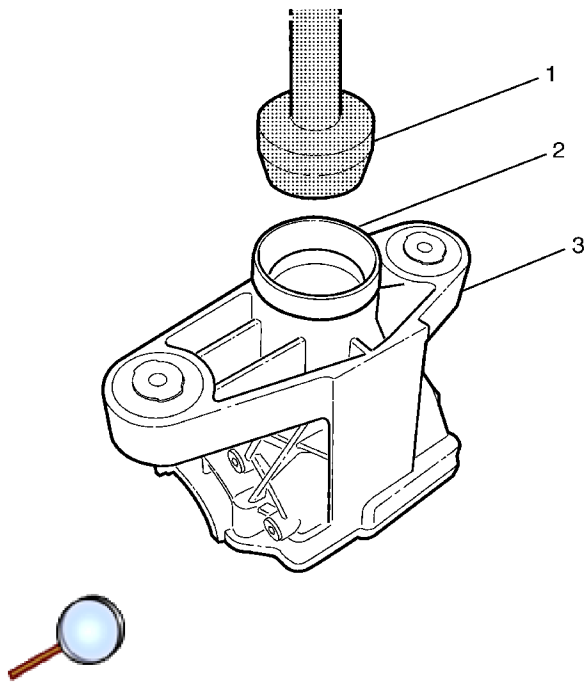


Important: To make fitting easier cool the bearing cups (2).

18. Position the NEW head bearing cup (1) into the differential housing (2).

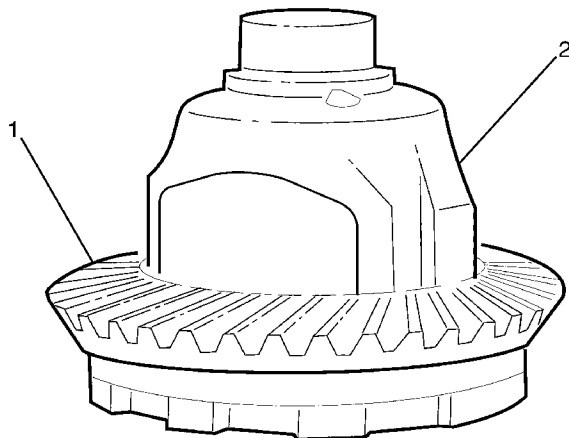


19. Press the NEW head bearing cup in with [DT-48723](#) (1) and rotate until it fits tightly in the front differential housing (2).
20. Use a feeler gauge to make sure the NEW head bearing cup is seated correctly.



Important: To make fitting easier cool the bearing cup (2).

21. Position the NEW tail bearing cup (2) to the differential housing (3).
22. Press the NEW tail bearing cup in with [DT-48725](#) (1) and rotate until it fits tightly in the front differential housing (2).
23. Use a feeler gauge to make sure the NEW tail bearing cup is seated correctly.



Important: Warm the ring gear (1) evenly using a hotplate until it fits over the differential (2).

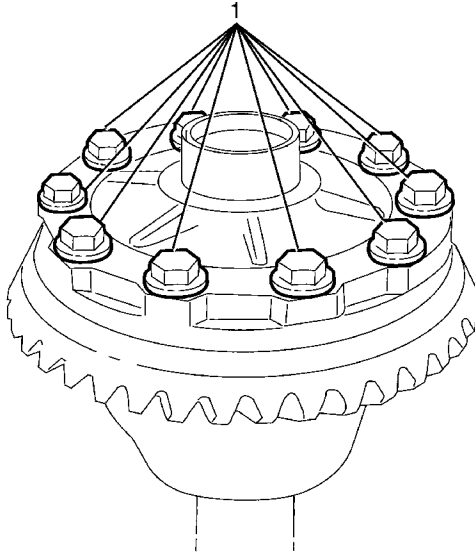
24. Position the ring gear (1) to the differential (2).

Important: Do not fully tighten the NEW ring gear to differential retaining bolts at this stage.

Important: The ring gear has to cool before the ring gear to differential retaining bolts can be tightened.

25. Install two NEW ring gear to differential retaining bolts.

Notice: Refer to [Fastener Notice](#) in the Preface section.



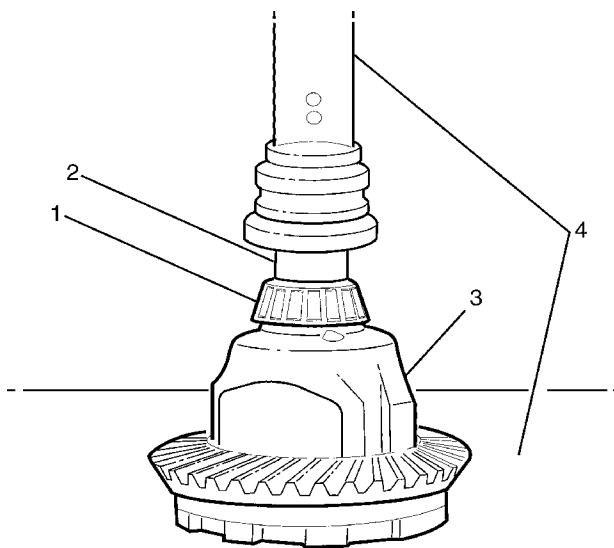
Important: The ring gear has to cool before the ring gear to differential retaining bolts (1) can be tightened.

Important: Tighten the ring gear to differential retaining bolts (1) working diagonally.

26. Install the remaining NEW ring gear to differential retaining bolts (1).

Tighten

Tighten the bolts to 125 N-m (96 lb ft).

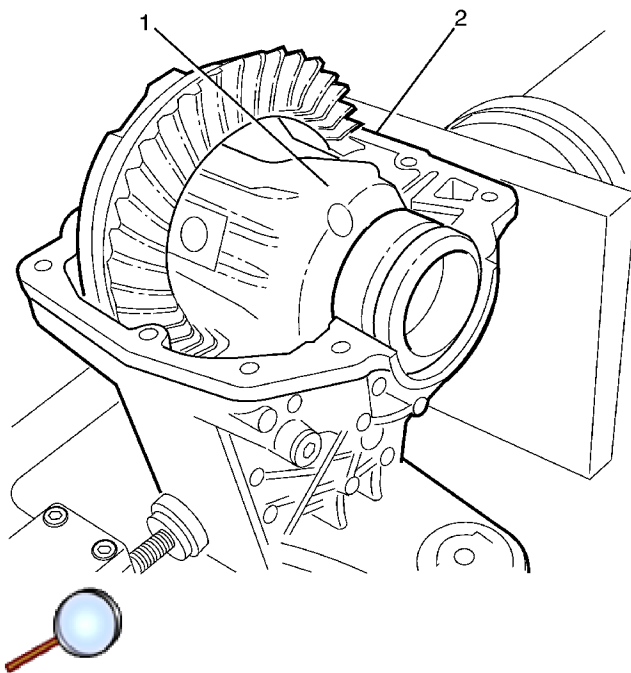


Important: Use a suitable press (4) to install the right differential bearing (1).

27. Press the right differential bearing (1) to the differential (3) with [DT-48728](#) (2).

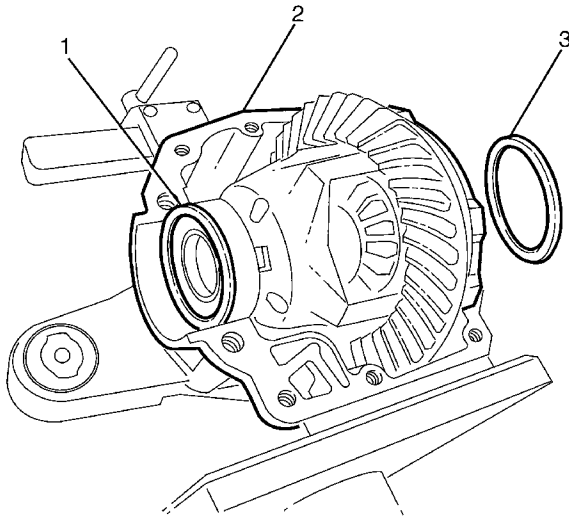
Important: Use a suitable press (4) to install the left differential bearing.

28. Rotate and press the left bearing to the differential with [DT-48728](#) (2).

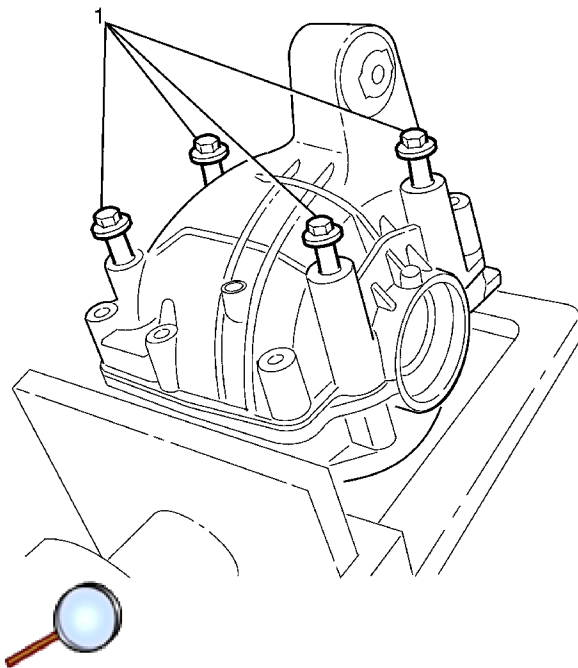


Important: Position the differential (1) to the differential housing (2) using a suitable tool or with the aid of an assistant.

29. Position the differential (1) to the differential housing (2).

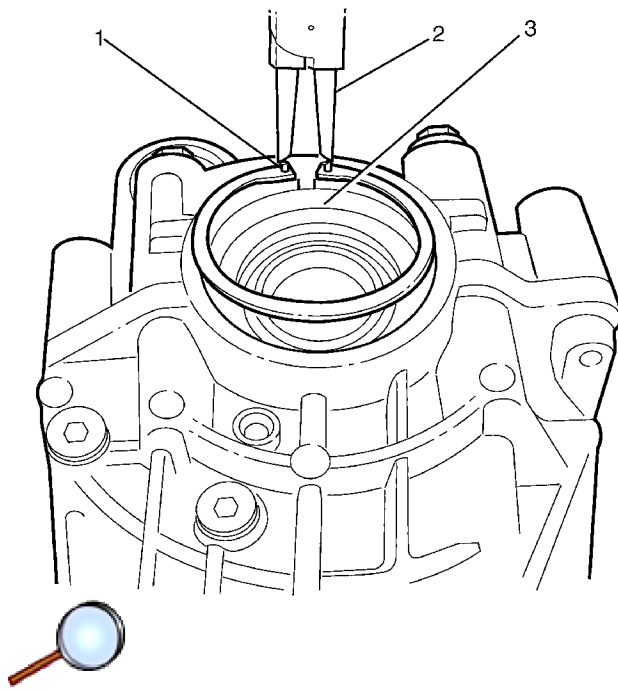


30. Position the left shim (3) and right shim (1) to the original position in the differential housing (2).



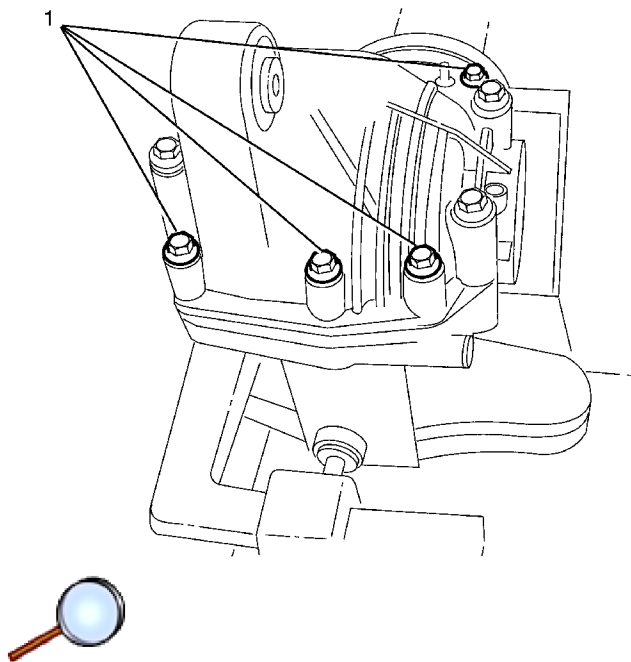
Important: Do not fully tighten the bearing bolts (1) in stage. The differential has to be able to move freely within the differential housing to allow fitment of the circlip.

31. Position the differential housing cover to the differential housing and retain with the 4 bearing bolts (1).
32. Turn the differential assembly left through 90° for the differential to slide down in the housing.



Important: Align the opening of the circlip (1) with the opening on the differential housing.

33. Install the circlip (1) to the differential (3) with circlip pliers (2).
34. Make sure the circlip (1) is fitted correctly.



Important: Tighten the differential housing cover to differential housing retaining bolts (1) working diagonally.

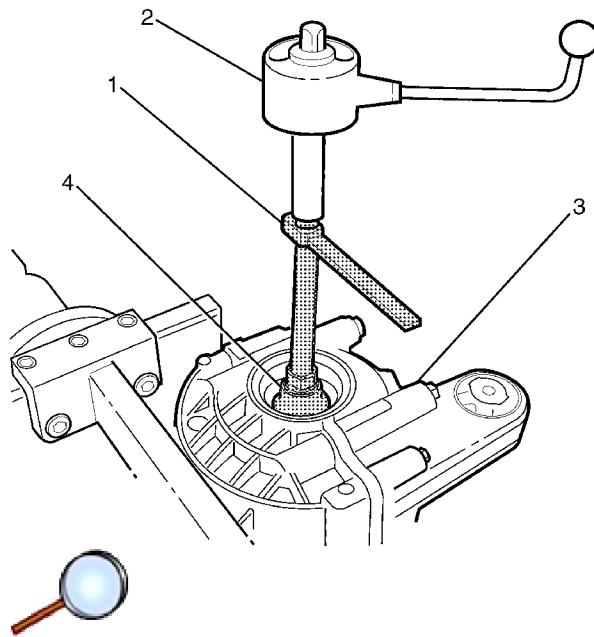
35. Install the remaining differential housing cover to differential housing retaining bolts (1).

Tighten

Tighten the housing bolts to 53 N-m (39 lb ft).

Tighten

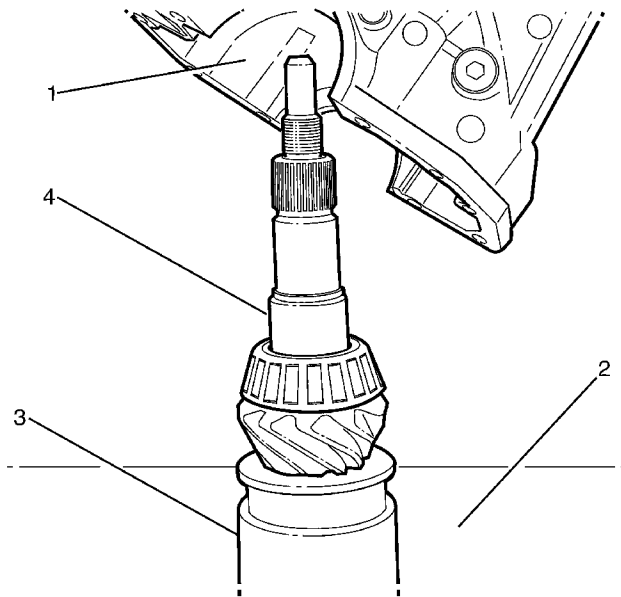
Tighten the bearing bolts to 153 N-m (112 lb ft).



36. Position the backlash tool (1, 4) to the differential assembly (3).
37. Secure the backlash tool (1) to the differential assembly (3) by adjusting the spreading nut (4).
38. Mount the turning torque gauge (2) to the backlash tool (1).
39. Rotate the turning torque gauge (2) clockwise and record reading.

Important: This figure is for NEW bearings only.

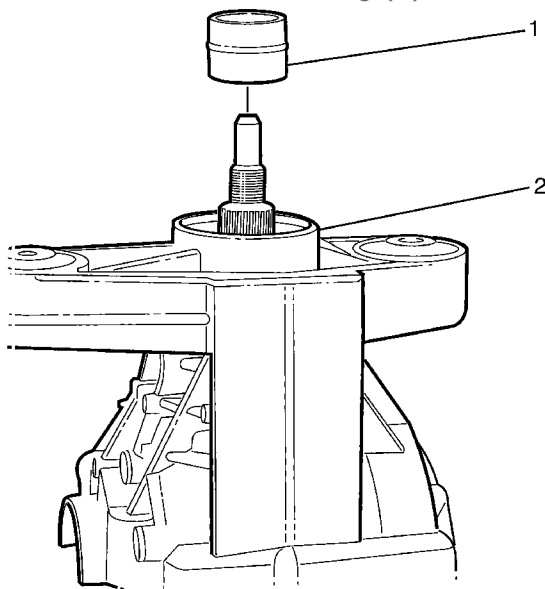
40. Turning torque should be between 2.0 to 3.3 Nm (27 lb in).
41. If the measured turning torque is outside the tolerance:
 - Remove the rear differential housing.
 - If turning torque is too high or too low, fit a thinner or thicker shim respectively.
 - Repeat from steps 5-11 from the disassembly procedure then from step 27 onwards in the assembly procedure.
 - Check turning torque. Repeat until the turning torque is correct.
42. Remove differential assembly. Repeat steps 5 through 11 from the disassembly procedure.



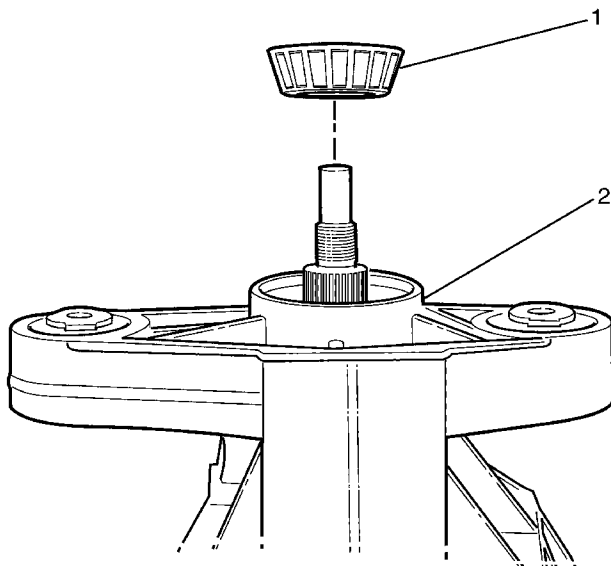
43. Position the pinion (4) on [DT-48728](#) (3) in a suitable press (2).

Important: The differential housing (1) must not rest on the press (2). Use a suitable supporting tool (3) to elevate pinion (4).

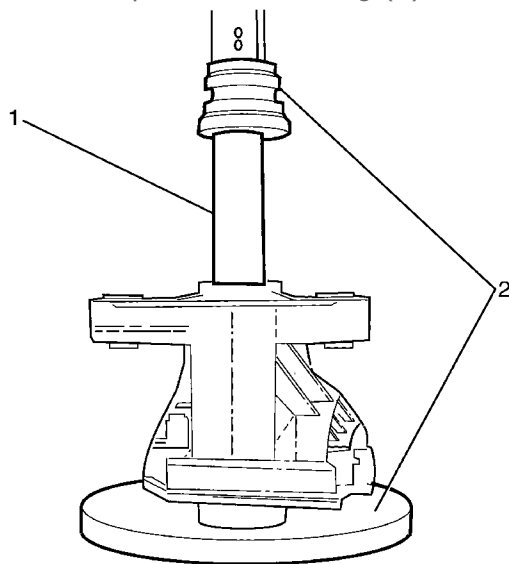
44. Position the differential housing (1) over the pinion gear (4).



45. Position a NEW collapsible spacer (1) to the differential (2).

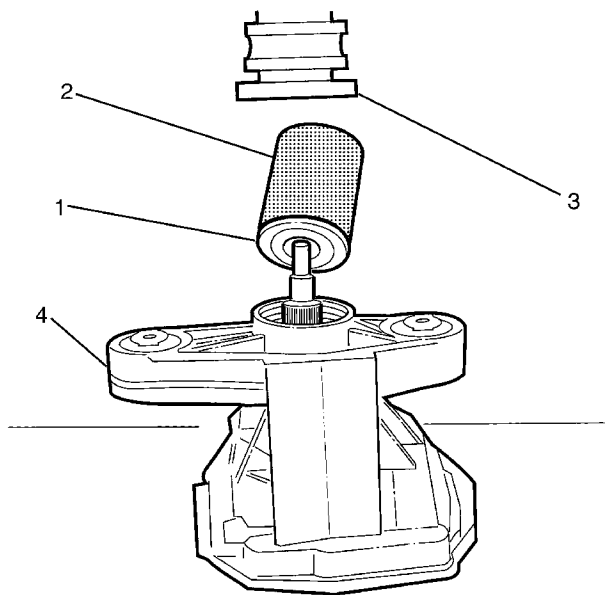


46. Position the pinion tail bearing (1) to the differential housing (2).



Important: Take care to only press the tail bearing until it rests on the collapsible spacer so that it is not damaged.

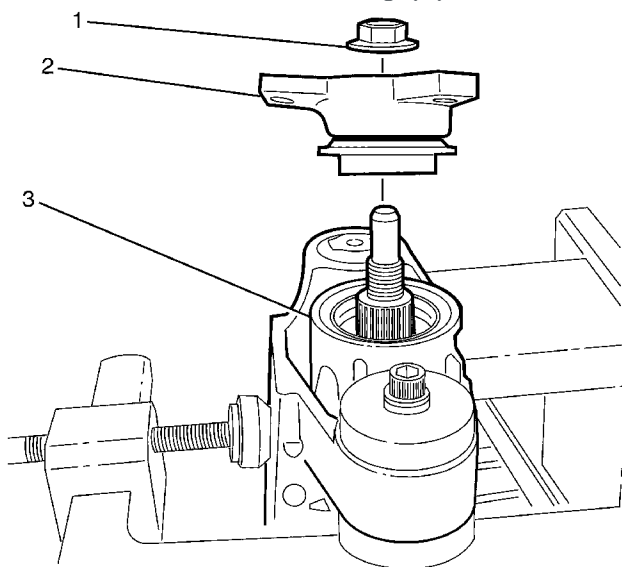
47. Use a suitable press (2) and [DT-48723](#) (1) to press the tail bearing until it rests against the collapsible spacer.
48. Remove the supporting tool so that the differential housing rests on the table.



49. Lubricate the NEW pinion flange seal (1) with correct grease. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#) .

Important: Use [DT-48727](#) to install the seals to correct depth.

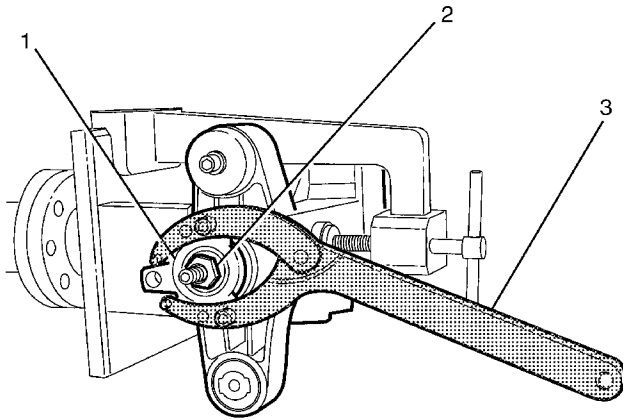
50. Install the pinion flange seal (1) to the differential housing (4) with [DT-48727](#) (2) in a suitable press (3).
51. Mount the differential housing (4) on a suitable holding device.



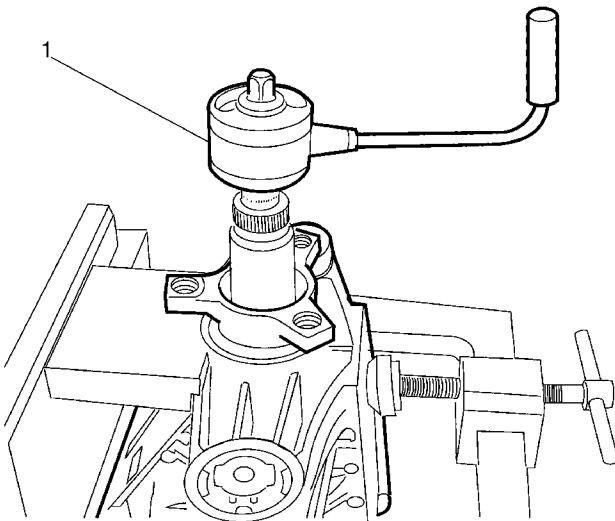
52. Position the pinion flange (2) to the differential (3).
53. Lubricate the contact surface of the prevailing torque pinion flange retaining nut (1) with correct grease. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#) .
54. Apply correct loctite to the thread of the NEW prevailing torque pinion flange retaining nut (1).

Important: Do not fully tighten the NEW prevailing torque pinion flange retaining nut at this stage. Overtightening will require disassembly and fitment of a new collapsible spacer and possibly bearings.

55. Install the NEW prevailing torque pinion flange retaining nut (1) to the differential (3).



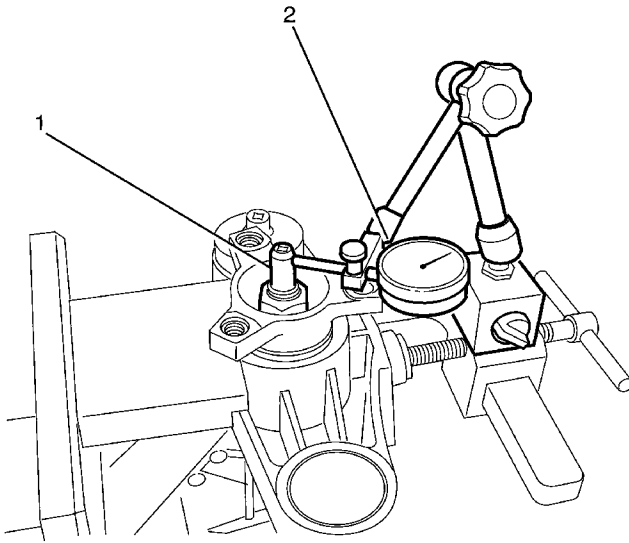
56. Install the universal pulley holder (3) to the pinion flange (1).
57. Tighten the prevailing torque pinion flange retaining nut (2) carefully until it has no play.
58. Remove the universal pulley holder from the pinion flange (1).
59. Turn the differential assembly through 90°.



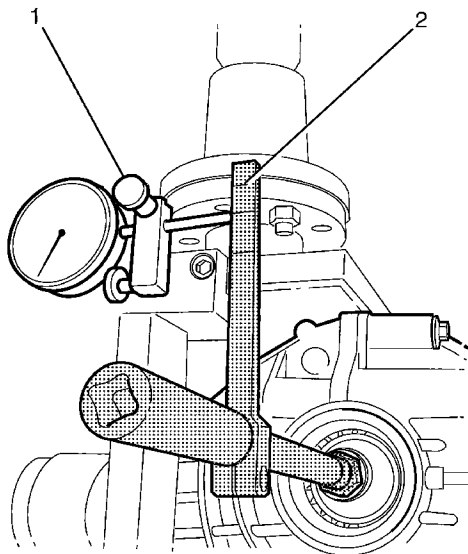
60. Position the turning torque gauge (1) to the prevailing torque pinion flange nut.
61. Turn the turning torque gauge (1) in a clockwise direction and record reading.

Important: This torque figure is for NEW bearings only.

62. Turning torque should be between 2.2 and 2.7 Nm (20-25 lb in).
63. If the turning torque is below specified tolerance, tighten the prevailing torque pinion flange retaining nut in small steps and check turning torque until specified turning torque is reached.
64. If the turning torque is above specified tolerance disassemble, fit new collapsible spacer and repeat until correct specification is achieved.



65. Position a dial gauge (2) to measure the concentric running on centering while turning the pinion (1).
66. If the measured value is above .1mm remove the pinion flange and re-install at a different angle. Repeat steps 52-66 in the assembly procedure. Make sure the turning torque is .1-.2 N-m higher than recorded in step 63 but not higher than 2.7 N-m.

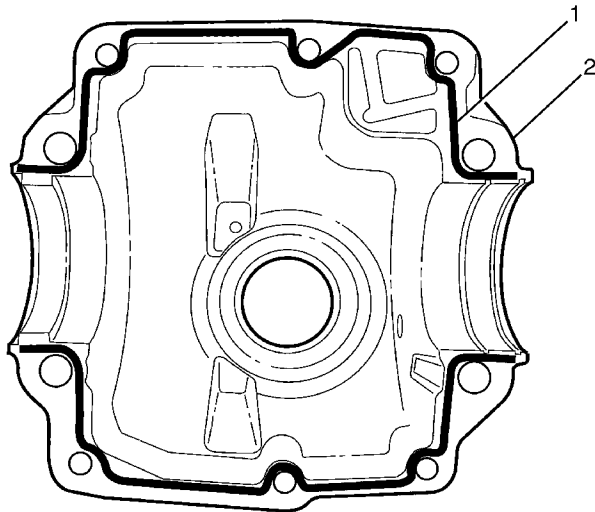


67. Position the backlash tool (2) to the differential assembly.

Important: The location of the dial gauge on the backlash tool (2) arm corresponds to the

edge of the ring gear (210mm)

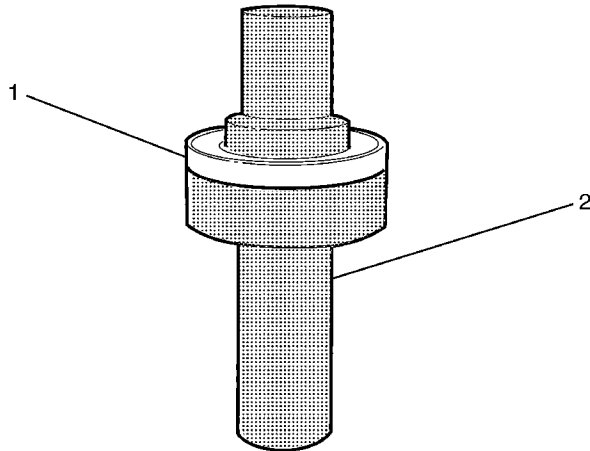
68. Position the dial gauge (1) to the backlash tool (2).
69. Use a suitable tool to move the backlash tool (2) within the backlash and record the reading.
70. Backlash must be between .07 and .18 mm.
71. If the backlash is not between the specified tolerance, it must be adjusted with differential shims otherwise turning torque set during steps 38-43 will be changed.
72. If a .05 mm thinner shim is used on the right a .05 mm thicker shim has to be added to the left.
73. Remove the rear differential housing. Refer to steps 5 and 6 in the disassembly procedure.



74. Clean the mating faces of the differential housings (2).

Important: Apply a 1mm liquid seal bead (1) to the differential housing. Use the graphic as a template.

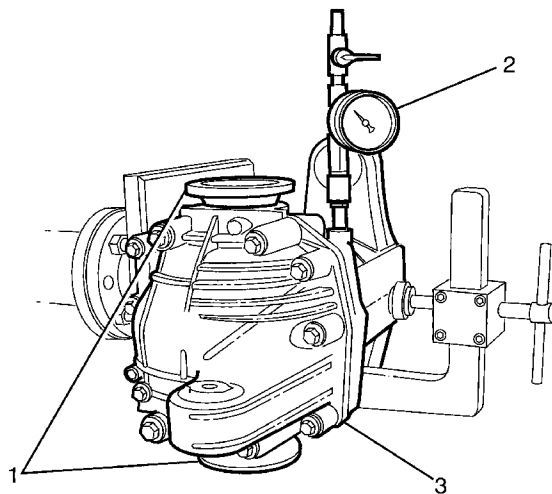
75. Apply a 1mm liquid seal bead (loctite 5910).(1) to the mating face of the differential housing. Refer to [Adhesives, Fluids, Lubricants, and Sealers](#) .
76. Install the differential housing cover to the differential housing. Refer to steps 26 through 33.



Important: The left and right rear axle shaft seals are different sizes so there are 2 different size installers. Make sure that the correct seal installer is used for the correct seal.

Important: Fill the space between the dust lip and the seal lip with the correct grease.

77. Install the left and right rear axle shaft seals (1) using [DT-48722](#) and [DT-48721](#) (2).



78. Install two rear axle flanges or two sealing plugs (1) to seal the differential (3).

Important: Set the air pressure regulator to .4 bar before connecting.

79. Remove the oil drain plug and install the air pressure regulator (2).
80. Connect the air supply to the regulator (2) and pressurise the differential (3) to .4 bar.

81. Disconnect the air supply from the regulator (2).
82. The pressure should not decrease from .4 bar within 3 minutes. If the pressure decreases, locate and repair leakage.
83. Install the differential (3) to the vehicle. Refer to [Differential Replacement](#) .
84. Fill the differential fluid. Refer to the filling procedure in [Differential Oil Replacement](#) .